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# Changes by accident or design: An analysis of trends in American nursing from a feminist perspective (1870-1988)

Gloria Giaveno Straughn  
*University of New Hampshire, Durham*

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**Changes by accident or design: An analysis of trends in  
American nursing from a feminist perspective (1870–1988)**

Straughn, Gloria Giavenc, Ph.D.

University of New Hampshire, 1989

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CHANGES BY ACCIDENT OR DESIGN:  
AN ANALYSIS OF TRENDS IN AMERICAN NURSING  
FROM A FEMINIST PERSPECTIVE  
(1870-1988)

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DISSERTATION

Submitted to the University of New Hampshire  
in Partial Fulfillment of  
the Requirements for the Degree of

Doctor of Philosophy

in

Sociology

December, 1989

This dissertation has been examined and approved.

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*12/7/89*

December 7, 1989

## DEDICATION

This dissertation is dedicated to  
My beloved Godparents, Aunt and Uncle,

Mary Louise Giaveno White  
(1917-1980)

Leonard Tremayne White  
(1922-1988)

for their unconditional love and support.

You are missed.

## ACKNOWLEDGEMENTS

There are so many people to thank for helping me finish this dissertation that the list could form its own chapter. I hope that I will not forget anyone, but that is surely a possibility. For that I am sorry; please understand.

First and foremost I want to thank my husband, Bill, for his love support, patience and caring. I could never have come this far without him. He not only supported me with words and deeds of love, but he also shopped, cooked, cleaned, computed, ran endless errands, etc.. I could go on forever. In essence, he was there as my partner for over twenty years.

My children, Celka and Ian, did the same. They gave me their love and support, ate "micro meals", typed references, did laundry, baked their own cookies, and said over and over again that they were proud of me. You know how proud I am of you, and how much I love Daddy and you. Stanford and Phillips Exeter don't know what gems they have. Well, perhaps they do.

An Oreo to Tremayne, my "data" dog and a "Pounce" to Hosmer, my "computer" cat, I know I haven't been much fun lately.

My parents-in-law, Connie and Bill Straughn were a constant source of understanding and practical wisdom. My mother, Celka, and my grandmothers, were a secret source of strength. Their lives were never easy or peaceful, but they endured and triumphed. My father, Aldo, in his own way, gave his support and love.

My godparents, my aunt "Weasel Mary" and "Gentle" Uncle Lennie were the constants in my life. My only regret is that they are not here to share these moments with me.

My other family members, Dorothy, Jim, Art, Carol, Tate, Grant, Linda, Charlie and Kevin, the newest, always believed in me and were convinced that I could do it. Although at times, they wondered why.

My "small circle of friends" also helped to make all of this possible, usually by bailing me out of some disaster. For this I thank you all. I thank especially, April Carty, RN, BSN, who is not only a true friend, but one who read and commented on every draft of this dissertation. Now it's your turn, April. Kate Pope gave me not only the great gift of friendship, but her Word Perfect skills as well. Ferial and Fayez Moussa, Arthur and Linda Starr, Judy and Tom Bisett, Frank and June Gallinaro, Ursula and Etienne Prothon, Judy and Joe Capobianco, Annie and Bob Lavoie, Cherie and Mitch Schwartz, Ellen and Ken Brookes, Wes and Jean Duling, and all of their families, loved and cared for me and my family. They fed us, chauffeured our children, ran errands, and so much more. Most of all they gave us all manner of support and

assistance.

I want to give special thanks to two groups of women who mean a great deal to me and who taught me two important "facts of life": that feminism isn't just an ideology or a movement; it is a positive way of life; and that caring is more than just an abstract concept; it is a learned behaviour; and it is an integral part of nursing and teaching. Thank you to my nursing and teaching colleagues and friends: the CMC Level I, II and III nursing faculty, April Carty, RN, BSN (again), Sister Magdala Keefe, RN, BSN RSM, Mary Ellen Letvinchuk, RN, BSN, M.Ed., Patty O'Rourke, RN, BSN, Carmen Petrin, RN, BSN, and Lorraine Pelkey, RN, BSN; and the NEC "Women and Work" group: Sabra Welch, RN, MSN, Betsy Alexander, PhD, Carolyn Picciano, MA, and Jocelyn Sanders, AB.

Continuing on the academic side, I want to thank my early mentors, Anne Fishel, RN, PhD, Nora Cline, RN, MSN, Dorothea Leighton, MD, and Bert Kaplan, PhD. You taught me, pushed me, and inspired me along the way.

I also want to thank several member of the UNH Sociology Department for making my time in the department a positive learning experience. Thank you Arnold Linsky, PhD, for the tea, the early morning seminars and sharing your knowledge and expertise in medical sociology. Thank you Peter Dodge, PhD, for always trying to "fit me into" the teaching schedule in a way that my needs could be met as well as the department's needs. A very special thank you to Sally Ward, PhD, for the many talks, the "hand-holding", and most of all for being an outstanding role model as female faculty member. Thank you also to Deena Pescke; you always made things work.

The members of my doctoral committee deserve the most sincere thanks for not just for "going the distance", but for the years they devoted to teaching me, nurturing me, and believing in me. Thank you, Larry Hamilton, PhD, for forcing me to not only learn statistics, but to teach it. Thank you also for your friendship and endless patience. A very important "thank you" also goes to Leslie Hamilton, Larry's "other voice". You and your family made these years a joy. Thanks are more than in order for Murray Straus, PhD, Walter Buckley, PhD, and Chuck Kimbal, Ed.D. You helped me to grow professionally and supplemented my clinical skills with research skills. You helped me to become a sociologist. You were also the finest role models of academic excellence that any student could have. For Helen Morrison, Ed.D, "the ringer" and "queen of an antiquarian book empire", see what advertising got you. Thanks is not enough for you; my love to you, Ian and your family.

Lastly, I want to thank my students. In the end, it is you who make this all worthwhile. You make teaching/learning the interactive process that it must be, in order to be successful.

### QUOTATION

Many years ago when Harvard's football team was at a low ebb,  
a famous sports writer said he heard the school was  
willing to trade any ten deans for a good tailback.....  
Nowadays, a busy hospital should be willing to trade  
a few doctors, a few trustees,  
and a whole platoon of administrators  
for a dozen dedicated nurses  
who like to nurse.

Howard A. Patterson, M. D.,  
former President of the American College of Surgeons  
at the Medical Alumni Association Meeting  
University of North Carolina  
May 5, 1970

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## ABSTRACT

### CHANGES BY ACCIDENT OR DESIGN: AN ANALYSIS OF TRENDS IN AMERICAN NURSING FROM A FEMINIST PERSPECTIVE (1870-1988)

by

Gloria Giaveno Straughn  
University of New Hampshire, December 1989

This exploratory study analyzed trends in American nursing from 1870-1988. The study used three kinds of graphical analysis (timeplots, scatterplot matrices and residual plots) to informally test fifteen hypotheses regarding nurse supply. Nurse supply was broken into two categories: nurse requirement, or the actual number of nurses employed in nursing at any one point in time; and nurse availability, or the potential number of new nurses needed to be produced or recruited. The hypotheses focused on two broad empirical research questions: "How many nurses are there?" and "How many nurses are enough?". Feminist conceptual frameworks were employed to inform the research by: suggesting explanatory social structural variables, which described women's labor force participation; and focusing the interpretation of the findings, so that they "take women into account". The major findings of this study, which considered nursing as "women's work", generally supported the hypotheses. The findings can be summarized into three major areas: (1) nurse labor force participation parallels women's labor force

participation; (2) RN salaries, overall female salaries, women's labor force participation, and women's educational attainment are good predictors of nurse requirement and availability; (3) The requirement and availability of nurses at different levels of educational attainment are affected by the availability of different worksites, worksite characteristics, and female labor force participation, stratified by age. The findings underscore the importance of the data, and the story that they tell us. This is the best way we have of knowing how many nurses there are, and how many are enough.

## CHAPTER I

### INTRODUCTION AND OVERVIEW

Health care is a major concern in the United States. It is estimated that in the year 2000 the cost of health care will reach 1.9 trillion dollars or 14% of the Gross National Product (GNP) as a result of trends in aging, chronic disease and complementary economic pressures.<sup>1</sup> Cost containment measures, such as, the introduction of national health insurance, the increased enrollment in health maintenance organizations (HMOs) or other prospective payment options, and the cross training or cross utilization of ancillary and auxiliary health care personnel, are anticipated health care system changes expected to hold down costs while promoting wellness.

Nurses, the single largest group of health care providers, perform key roles in the American health care system. Their continued presence in the health care system is of concern to many Americans. The media bombards us at regular intervals with stories of hospitals that have had to close their doors, because nurses were not available. Critical shortages of nurses are said to be occurring across the nation.

Much national attention has been focused on two important health care questions: "How many nurses are there?" and "How many nurse are enough?". Responses to these question have been offered in the literature for the past seventy-five years. Many of these responses have come in the form of responsible research findings from a number of disciplines.

This exploratory study analyzes trends in nursing from 1870-1988 with the objective of identifying those factors associated with nurse supply. Nurse supply is the number of nurses actually employed in the workforce at a particular point in time. Nurse supply reflects the requirement and availability of nurses; how many there are, and how many are needed. Those factors which are associated with the production and recruitment of nurses for the nurse labor force are examined over time.

### Methodology

Historically, trends in nursing have been seen as lacking in autonomy and self direction, almost accidental products of demography, economics and medicine. Nursing as a profession has been seen as a reactor rather than an actor with regard to nurse recruitment and production. This study looks at nursing from the perspective of historically initiating change as well as responding to change. Time series analysis is used in this study to allow the "data story" to be read.<sup>2</sup>

Timeplot analysis enables the data to "tell the story" of nursing variables over time. Further analysis, using scatterplot matrices, enables the researcher to see the association between nursing variables and demographic, economic, social structural and other health care variables.

Persistent complaints of nursing shortages have been documented in the literature alongside contradictory reports, showing surplus production during the same time periods. These two statistical techniques also bring to light periods of nursing shortage and surplus over a period of several decades.

Residual plot analysis, a method of statistical criticism, uses scatterplots to identify problems in regression analysis. This simple technique is also advantageous in allowing researchers to see how closely their predictions come to estimating a regression line which represents the data.

### Sociological Research in Nursing

Nursing has been a much studied occupation, especially by sociologists, who have sought to identify and assess the role of the nurse in the health care system. The content of the nurse's role and the context in which she [males have never accounted for as much as 10% of employed nurses at any



one time (See Figure 1)] plays that role are an integral part of the social structure of the health care system.

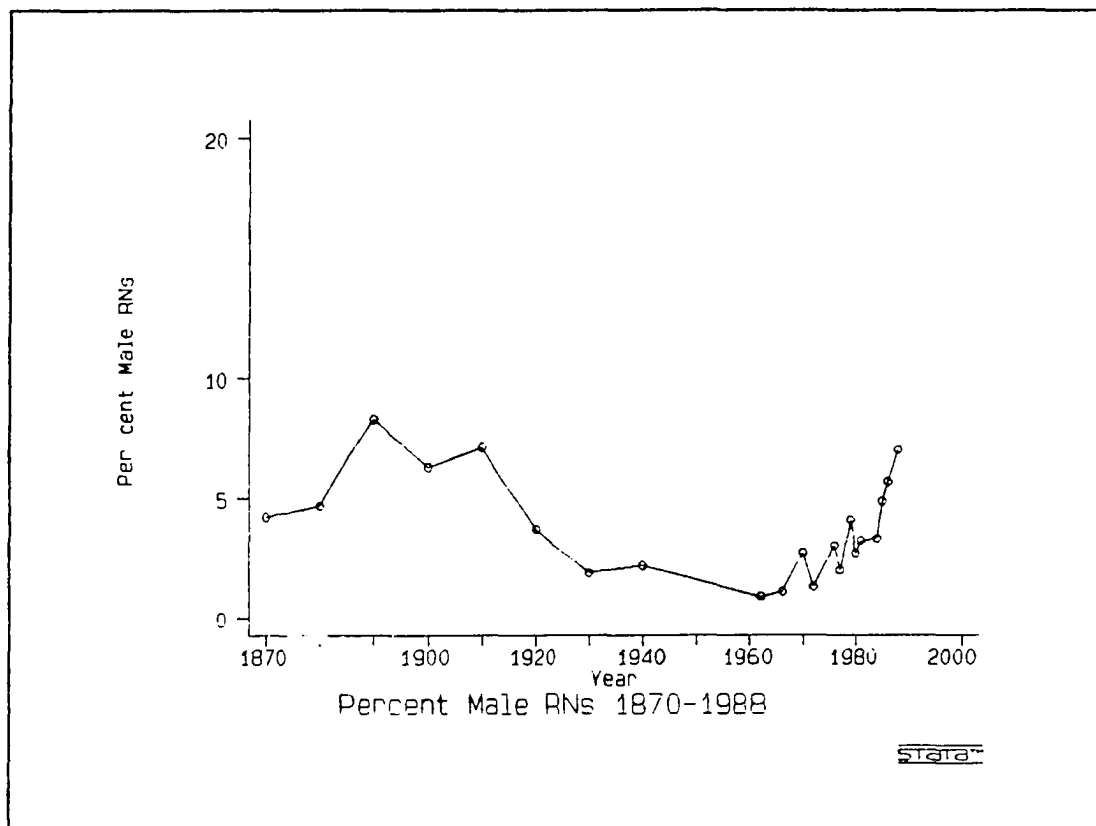


Figure 1. Trends in the number of Male RNs in the Workforce

The study of nursing is most appropriately the purview of sociology. Rightly or wrongly, sociology and sociologists have in the past been both praised and vilified for their research on health care in general and women in health care occupations and professions in particular. It is clear, however, that empirical questions about nursing trends should be considered from a sociological perspective.

Researchers who study working women must be open to a variety of methodologies. Sociology, the long-time "friend"

of nursing, offers these methodologies.<sup>3</sup> Within the discipline sociology also offers a way of thinking about women that recasts prior assumptions about the character and meaning of work. Sociology has also offered new explanations for patterns of gender in work that are consistent with the new feminist scholarship on women.

Unfortunately, the strength of the theoretical and methodological bond between sociology and nursing and sociology and feminism does not carry over to a similar friendship and alliance between feminism and nursing. A bond between nursing and feminism does not appear to exist either in print or in fact. Bibliographic searches of professional sources, summarized by Duffy<sup>4</sup> and repeated in this research, indicate that such a small percentage of journal articles and a limited number of book have been written in the 1980s, which primarily discuss any linkage between feminism and nursing. Still fewer sources are available which deal with feminist conceptual frameworks and their importance and application to nursing. Research in nursing, grounded in feminist thought, appears virtually nonexistent, especially when compared to the scholarly work done in other fields.<sup>5</sup> Ashley and Reverby are the most notable exceptions.<sup>6</sup>

These findings question whether feminist thought is being explored or feminist research is being conducted in conjunction with issues in nursing and, if so, why is it not being disseminated. The implications of such a dearth of

knowledge for and about women in a field dominated by women is compelling. The absence of a feminist perspective in the nursing literature, as Duffy points out, "biases the data that influence decisions in practice and research".<sup>7</sup>

### Feminism and Nursing

Feminism and nursing have had an "uneasy relationship".<sup>8</sup> The acceptance and ultimately the integration of the feminist perspective into nursing theory and nursing practice has been difficult at best. Nursing exists within an institutional environment which espouses a value system that is patriarchal, capitalistic and overwhelmingly white. Decision-making within the health care system is done almost exclusively made by males, while more than 75% of all health care personnel are female. While the feminist movement has recently had considerable impact on nursing education and practice in the crucial area of developing power within the health care system, feminism has by and large failed to inform nursing with regard to professionalism and occupational image. As Chinn notes, "a feminist perspective requires an uncompromising questioning of the forces that divide us one from the other, the ethics of our actions, and our co-optation into the unhealthy environment of the current health care system."<sup>9</sup> To date nurses have not been well educated in feminist scholarship and do not understand and appreciate that

the socialization of women in nurturance and caring does not necessarily lead to the renunciation of autonomy or the denial of legitimation. And in all fairness, feminists have not been educated about nursing and do not understand that nurses are fighting the conception that nursing is a ghetto for women, as well as the stereotypical view that nurses are the handmaidens of the medical care hierarchy. Nursing and feminism have much to gain from and much to offer one another.<sup>10</sup>

A feminist perspective can be beneficial to nursing and to analyses of nursing, such as this one, in two ways: (1) by suggesting the introduction of social structural variables, for example female labor force participation, into the analysis; and (2) by informing the interpretation of research findings so that "take women into account". Both strategies can be effectively employ by focusing the analysis on nursing as women's work.

## CHAPTER I ENDNOTES

1. Drew E. Altman, "Two Views of a Changing Health Care System", Applications of Social Science to Clinical Medicine and Health Policy, eds. Linda H. Aiken and David Mechanic (New Brunswick, NJ: Rutgers University Press, 1986) 103.
2. Lawrence C. Hamilton, Modern Data Analysis (Pacific Grove, CA: Brookes/Cole, 1990) 3.
3. M. V. Batey, "Values Relative to Research and to Science in Nursing as Influenced by a Sociological Perspective," Nursing Research 21 (1972): 504-508.
4. Mary E. Duffy, "A Critique of Research: A Feminist Perspective," 6 (1985): 341-352.  
Within the context of this research the number of sources identified as content specific to feminism and nursing were located and enumerated using two online searches, Medline and BRS Colleague (Medicine/Nursing), the periodical index, Index Medicus, and Books in Print; Bernhard's criteria, as cited in Duffy (345) were used to identify methodological works and were redefined [numbers 2-4] so that they could be applied to general and theoretical works.
5. Duffy, 341-352.
6. Ashley, 1976; Reverby, 1987.
7. Duffy, 345.
8. Alice J. Baumgart, "Women, Nursing and Feminism," The Canadian Nurse January (1985): 20-22.
9. Peggy L Chinn, "Feminism and Nursing," Nursing Outlook 33(2) (1985): 74-77.
10. Wilma Scott Heide, "Feminist Activism in Nursing and Health Care," Socialization, Sexism and Stereotyping: Women's Issues in Nursing, ed. Janet Muff (Prospect Heights, Illinois: Waveland Press, 1988) 255-271.

## CHAPTER II

### LITERATURE REVIEW: NURSING AS WOMEN'S WORK

Of the currently two million licensed registered nurses in the United States, 1.6 million are employed in nursing. The labor force participation rate for registered nurses has approached 80% in the last five years, the highest workforce participation rate among women workers.<sup>1</sup> The supply of registered nurses has never been higher, yet there is reputed to be a serious shortage of nurses which "portends disaster for our health care system"<sup>2</sup>. The issue at hand appears to be how well nursing supply and demand are measured.

Most studies of nursing supply and demand have focused on supply-side issues. Early studies, those prior to 1960, focused on the apparent chronicity of nursing shortages. The results were often contradictory and fueled the ongoing healthcare debate, which centered on whether nursing shortages were fact or fiction. Studies completed during the 1960s and 1970s accepted the predominant view that a shortage of nurses existed during most time periods. These studies focused on the nature and extent of the prevailing shortages, giving rise to the massive supply prediction and forecasting studies of those two decades. The most recent studies of nursing supply and demand continue the forecasting model development of the

previous decades. These 1980s studies, while producing sophisticated computer models for forecasting trends in nursing supply and demand, also explore and attempt to identify factors likely to be associated with trends in nurse supply. Contemporary studies of nurse supply focus on actual and potential nurse labor force participation, nurse requirement and availability. In these studies, requirement is defined as the actual number of nurses working in nursing at any point in time; availability is defined as the potential number of new nurses available to fill additional existing or planned positions in nursing. A shortage of nurses is, thus, seen as having more positions available than nurses to fill them, while a surplus is indicative of more nurses available and wanting to work than positions available for them to fill. To date the results of these studies identify three major factors associated with either actual and potential nurse supply: the population of females aged 18-25; RN wages; and the wages of female professional and technical workers.<sup>3</sup>

### Review of the Literature

#### Nursing Literature

Research in Nursing. Studies of nursing requirements and availability are of relatively recent origin. However, a number of early reports and analytic attempts exist which

should be considered. Most of these early studies were concerned with either systems of nursing education or nursing practice within an institutional framework.

### Early Nursing Research

Two Bureau of Education circulars on the training of nurses (1879, 1882)<sup>4</sup> appeared in the period following the opening of the three early Nightingale-inspired training schools in New England.<sup>5</sup> These reports supported the Victorian notion of the virtuous woman whose fitness for nursing could be further enhanced by appropriate training. It now became increasingly clear that Florence Nightingale was correct in her conviction that nurses needed organized practical training. She further believed that nursing was "the skilled servant of medicine, surgery and hygiene, not the skilled servant of physicians, surgeons, or health officials"<sup>6</sup>.

As improvements in nursing educational standards continued, nurses began to look outside of the discipline for validation of their ideas. Professional research had given needed support to the organized development of medical education with the publication of the 1910 Flexner Report.<sup>7</sup> This report is largely credited with being the catalyst for change within systems of medical education. Based on this report, the Flexner model of medical education was developed, which is still followed by most American medical schools today.<sup>8</sup> As a result of the influence of the Flexner Report, a nursing counterpart study entitled, Nursing and Nursing



Education in the United States, commonly referred to as the Goldmark Report for its researcher/author, Josephine Goldmark, was issued in 1923.<sup>9</sup> This study investigated the educational opportunities open to nurses who wanted to work in the community, and also issued a series of recommendations for strengthening of hospital schools of nursing. These recommendations were based on Goldmark's empirical analysis of 23 schools of nursing and 49 community agencies.<sup>10</sup>

Following the Goldmark Report, a number of other early studies were reported by the Committee on Grading of Nursing Schools. These include Burgess's study, Nurses, Patients and Pocketbooks (1928)<sup>11</sup>, and the two separate surveys (1930, 1932), culminating in the 1934 Nursing Schools Today and Tomorrow Final Report<sup>12</sup>, which used questionnaire data to substantiate recommendations for accreditation and rating of schools of nursing, working hours of students and staff, and adequate instruction and staffing for hospital schools of nursing. All of these reports were designed to "reform" nursing education and lend credence to M. Adelaide Nuttings' 1912<sup>13</sup> argument that education was imperative for the improvement of nursing care. Beyond that, they highlighted areas where change was needed.

#### Outcomes of Early Research Efforts

One of the most significant outcomes of the reports was the awareness of serious unemployment of nurses during the Depression. In response to this situation many small schools

of nursing closed their doors and many states raised the requirements for accreditation of other schools, resulting in a considerable decline in the number of programs in operation. (See Table 1.) This appears to be the first instance of any attempt to intentionally control the supply of nurses, and also signifies that, as a result of the dissemination of research findings, "the era of gross exploitation of student nurses began drawing to a close"<sup>14</sup>.

This exploitation was a product of the apprenticeship system. Under the apprenticeship system hospitals employed few graduate nurses. They staffed their wards with unpaid or poorly paid student labor. The tuition that these students were paying and their "on the job training" offset hospital costs for both proprietary and nonprofit hospitals. Nonprofit hospitals used the revenues generated by nursing tuition and labor to offset the cost of revenue losing departments, usually food service and medical records.

**TABLE 1. Extent and Development of Basic Programs  
for the Preparation of Registered Nurses,  
(Selected Years)**

Year	Total (Programs)	Diploma	BSN	ADN	Total (Schools)
1873	5	5			5
1880	15	15			15
1890	35	35			35
1900	432	432			432
1905	862	862			862
1910	1129	1129			1129
1915	1509	1509			1509
1920	1766	1755	11		1755
1930	1908	1885	23		1885
1940	1387	1311	76		1311
1950	1314	1118	195	1	1203
1955	1125	981	146	34	1139
1960	1128	900	171	57	1128
1965	1182	813	197	172	1180
1970	1340	636	267	437	1330
1975	1362	428	326	608	1349
1980	1385	311	377	697	1360
1985	1473	256	441	776	1434

Sources: M. A. Nutting. United States. Bureau of Education. Educational Status of Nursing. Bureau of Education Bulletin 7 No. 475. Washington, D. C.: U. S. GPO, 1912; D. M. Jensen. History and Trends of Professional Nursing. St. Louis, MO: The C. V. Mosby Company, 1955; National League for Nursing. NLN Data Book. New York, NY: National League for Nursing, 1978; United States. Department of Health and Human Services. Health Resources Administration. Bureau of Health Professions. Division of Health Professions Analysis. Sourcebook-Nursing Personnel. DHHS Publication No. (HRA) 81-21. Washington, D. C.: U. S. GPO, 1981; National League for Nursing. Nursing Data Review 1987. New York, NY: National League for Nursing, 1988.

### **Methodology of Early Research Designs**

These studies were few and far between and were statistically and methodologically simple, but, in combination with other early studies on hospital nursing services and several specialized nurse supply surveys conducted by the federal government, the American Medical Association and two newly formed professional nursing organizations, the American Nurses' Association (ANA) and the National League for Nursing (NLN). These organizations provided an important data base for planning in nursing and nursing education.<sup>15</sup>

### **Pre and Post World War II Nursing Research**

**The Era of Controversy.** Following this early period and moving into the post World War II era, research on nursing availability and requirement increased dramatically, as measures were needed to document the demand for expanding health care services. Yett admirably summarizes the voluminous literature on "persistent" nursing shortages occurring over a fifty year period from the early 1920's to the period of the Vietnam War, ending his review with the passage of the Health Manpower Act of 1968 and the guaranteed expansions and extensions of the nurse training sections by the Nurse Training Act of 1971.<sup>16</sup> He also notes the growing controversy over the contradictory evidence reporting simultaneous nurse surpluses and shortages.

In his review he states that: "The 'feeling' that there exists a serious shortage of professional nurses developed

rather suddenly and spread at an amazing rate. It did not grow out of a smoothly functioning labor market with a history of employment stability."<sup>17</sup> Yett describes this "feeling" as being "as omnipresent as nursing itself is ubiquitous": "In fact, at no time in the history of the profession have experts felt there were no shortages of any type of nurse or that the overall quality of nurses available was adequate."<sup>18</sup>

During the 1920's and 1930's the problem of surplus production of nurses was the prevailing opinion, accompanied by predictions that the surplus would only get worse. However, reports of unfilled vacancies for nurses, particularly faculty and administrators, were common. The important difference, Yett notes, is that prior to the Depression, the experts were in virtual agreement that since the organized development of professional nursing in the 1890's, the number of nurses had continued to grow to overproduction levels in the 1920's.<sup>19</sup> Interestingly, most experts did not regard the Depression as the cause of unemployment in nursing; they believed that the Depression "simply made a bad situation worse", citing persistent and ongoing overproduction of inadequately trained nurses as the root cause.<sup>20</sup> The problem of overproduction was thought to have been stopped by the efforts of the educational "reform" drives of the Committee on the Grading of Nursing Schools, and sometime between 1935 and 1940 a number of factors, such as the decline in number of nursing school graduates, the introduction of the eight hour day by many

hospital employers, the replacement of student nurses by graduate nurses in hospital facilities, recent medical advances and the expansion of hospital beds, were identified as having contributed to the elimination of a surplus and the re-emergence of a shortage of nurses.

This generally accepted analysis of the pre World War II period can be summarized by a nursing expert who stated: "Few of us recognize the chronicity of the nurse shortage problem; instead we regard it as the 'present one', and make plans to 'relieve' it. So it has been for half a century, except for one brief period in the early thirties"<sup>21</sup>.

The World War II Era. During wartime it was generally acknowledged that both the civilian and military need for nurses was urgent. It is difficult to know whether the military supply and demand predictions were adequate, because the methodology used to generate them is not known. The increased demand for nurses both at home and in the armed forces appears clearly associated with the expanding needs of the military and the civilian response to wartime prosperity.

The Post War Era. Wartime efforts to increase the supply of nurses were generally successful, and after the war experts returned to the question of whether there would continue to be a shortage, or whether nurses returning home to civilian positions would cause a surplus. In 1946 the National Nursing Council estimated demand figures and calculated the current available supply, indicating the likelihood of a shortage.

Again nothing is known about the methods used in making these calculations, therefore, their significance is in question. However, the unanimity with which experts agreed on a post-war shortage of registered nurses, largely expected to be the result of a steady decline in the registered nurse labor force participation due to high marital and birth rates in the immediate post-war period, combined with the strong demand for medical care, and the Hill-Burton hospital construction and expansion programs, suggests that a dwindling supply coupled with a growing demand for registered nurses would assure a shortage, even though the number of graduates was increasing.<sup>22</sup>

**Federal Studies of Nurse Supply.** The federal government intervened to attempt to alleviate the "shortages", following a series of nursing manpower studies and the publication of the Ewing Report in 1948, which stated that there was a shortage of nurses and that those available were geographically maldistributed.<sup>23</sup> In 1949 the federal government established the Division of Nursing Resources (renamed the Division of Nursing in 1960) to oversee the quality and efficiency of nursing care and to assure proper utilization of nursing resources. The Division directed states to conduct surveys of nursing needs and resources and issued a manual containing a plan for data collection and analysis of nursing resources.<sup>31</sup> The manual was revised and the methodology refined and expanded in 1956 and again in 1972.<sup>32</sup>

**TABLE 2. Nurse Requirement and Availability Studies  
(Selected)**

Study/Date	Variables	Findings/ Recommendations
West 1950	RN graduations; years of professional activity; age; marital status; projected supply. Data from 1949 Inventory.	Relationships between nursing education and potential RN supply 40% of all RNs remain active; nursing is a more married profession; nurses continue to work more years, on the average, than other women workers; fairly steady stream of replacements for RNs who leave nursing during childbearing years; in the next decade supply of RNs will not reach wartime peak.
Benham, 1970	RN wages; RN labor force participation stock of RNs; RN supply.	Explanatory econometric model of RN employment and labor force participation; supply projections suggest that higher wages lead to increased mobility; as nurse substitute wages rise, RN wages increase increase in husband's income leads to decrease in labor force participation but increase in RN stock.
Altman, 1972	Economic, social and personal variables from 1960 census and 1962 ANA inven-	Supply and demand model yielding results consistent with Benham and other economists; theoreti-



Table 2. Continued

Study/Date	Variables	Findings/ Recommendations
	tory.	cal model seeks to explain labor force behaviour of women in general, especially married women; results note a bimodal pattern of female employment overall estimates of the potential supply of RNs will increase between 1970-1980.
Yett, 1975	Economic, social, demographic, and personal variables from nursing, government and other sources.	Econometric model points out that the hospital is the major influence in the labor market for RNs; notes that hospital wage structure is indicative of either a monopsony or oligopsony market; identifies two types shortages-short-term, relieved by mobilization of inactive RNs; term, requiring increased recruitment efforts and increasing attractiveness of nursing as a career; need to measure demand accurately to prevent occurrence of shortages.
Sloan, 1978	Personal variables, social-psychological, expected wage, and mobility.	Relationship between observed wage differentials, spouse's financial opportunities and migration; focuses on reasons for geographic maldistribution of RNS.

Table 2. Continued

Study/Date	Variables	Findings/ Recommendations
DHEW/DHHS Manpower Models, 1982 Pugh-Roberts, VRI, CSF, WICHE	NCHS, ANA and Sample Survey Data on demo- graphic, econ- omic, social- structural and health care variables from census data, 1972, 1977 Nurse Sample Surveys.	Projected RN require- ments based on future health care changes; forecasting based on "demands" and "needs" for predicting FTE RN requirements, using population, demand for services, nurse personnel requirements to calculate projections.
IOM, 1982	1977, 1980 Nurse Sample Surveys, 1977 ANA inven- tory, AHA, NCHS, and other data, sources on health care utilization and population variables.	Synthesis and in- pretation of existing data to determine impact of health system changes on nurse requirements; recommendations include-no specific federal supports to increase nurse supply; maintain state and local nursing education support to prevent further geographic maldistribution; improvement in use of nursing resources; financial support for a variety of pathways in nursing education; continued support for research efforts; findings suggest that national supply and demand remain in balance; to prevent any present or future shortages, demand should be carefully examined.

Sources: Margaret D. West. "Estimating the Future Supply of Professional Nurses." American Journal of Nursing. (October 1950): 656-658; Margaret D. West and Christy Hawkins. Nursing Schools at Mid-Century. New York: New York National Commission for the Improvement of Nursing Services, 1950; Lee Benham. "The Labor Market for Registered Nurses: A Three Equation Model." The Review of Economics and Statistics 53.3 (2 August 1971), Massachusetts: Harvard University Press; D. C. Jones, et al. United States. Department of Health, Education, and Welfare. Public Health Service. Health Resources Administration. Bureau of Health Manpower. Division of Nursing. Trends in Registered Nurse Supply. Health Manpower References. DHEW Publication No. (HRA) 76-15. Washington, D. C.: U. S. GPO, 1976; Stuart H. Altman. United States. Department of Health, Education, and Welfare. Public Health Service. National Institutes of Health. Bureau of Health Manpower Education. Division of Nursing. Present and Future Supply of Registered Nurses. DHEW Publication No. (NIH) 73-134. Washington, D. C.: U. S. GPO, 1972; Donald Yett. An Economic Analysis of the Nurse Shortage. Lexington, MA: D. C. Heath and Company, 1975; Frank A. Sloan, United States. Department of Health, Education, and Welfare. Public Health Service. Health Resources Administration. Bureau of Health Manpower. Division of Nursing. Equalizing Access to Nursing Services: The Geographic Dimension. Health Manpower References. DHEW Publication No. (HRA) 78-51. Washington, D. C.: U. S. GPO, 1978; United States. Department of Health, Education and Welfare. Public Health Service. Health Resources Administration. Bureau of Manpower. Assessment of Health Manpower Modelling Efforts and Development of Alternative Modelling Strategies. DHEW Publication No. (HRA) 77-17. Washington, D. C.: U. S. GPO, 1976; Robert T. Deane and Kong-Kyun Ro. United States. Department of Health, Education and Welfare. Public Health Service Division of Nursing. Comparative Analysis of Four Manpower Nursing Requirements Models. DHEW Publication No. (HRA) 79-9. Washington, D. C.: U. S. GPO, 1979; Committee on Nursing and Nursing Education. Institute of Medicine. Nursing and Nursing Education: Public Policies and Private Actions. Washington, D. C.: National Academy Press.

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State surveys provided a major source of nurse supply data, while serving as a political tool to force state legislative action in support of nursing and nursing education.

At about this time other sources of state and national data on nurse characteristics and nurse supply also became available through the American Nurses' Association (ANA) in 1949, the Interagency Conference on Nursing Statistics (ICONS) in 1953, the National League for Nurses (NLN), and U. S. Census decennial reports. Estimates of nursing requirements from 1950 to the present have utilized these, as well as other more recent sources of data, duly noting the specific limitations of each. Table 2 summarizes major selected studies of nurse supply and demand conducted from the post World War II period to the present. Document I. in Appendix A. gives detailed description of the forecasting models developed by these studies.

The majority of the studies summarized, as well as other representative examples, focus solely on supply side issues. The issues examined are complex and diverse, but they are generally concerned with the profession or occupation of nursing itself. Included among these issues are aspects of the health care delivery system, consumer needs, employment trends within the health care delivery system, working conditions, characteristics of potential candidates for schools of nursing, the availability and suitability of educational

facilities for nursing, and the nature, prestige, and appeal of the work.

### Post War Nursing Trends

World War II is generally seen as a watershed for American nursing. This era marked the massive entry of government into the field of nursing with burgeoning federal supports, acceleration of nursing programs, and an evidenced movement toward equality and education in employment for women. Within nursing itself there was a concerted shift from private duty nursing to hospital nursing, and an effort at recruitment of black and minority nurses alongside attempts to improve the status of nursing and nurses.<sup>33</sup>

Undoubtedly, the keystone of the postwar advancement of nursing was the 1948 publication of anthropologist, Esther Lucille Brown's Carnegie Foundation study, Nursing for the Future<sup>34</sup>. This report synthesized the current system of nursing education, noting that it could not produce an adequate supply of nurses or types of nurses to meet national needs. Most importantly, this third major study of American nursing, stated the fundamental principle that professional education in America is the responsibility of institutions of higher education, and, therefore, professional nursing education belongs in a college or university setting.

The publication of the Brown Report began a period of struggle, contention, controversy and compromise in American nursing, which continues to this day. As nursing educators and

hospital administrators examined the recommendations in the Brown Report, they recognized that not all nursing tasks required a full three or four year education. The solution was to stratify the role of the nurse into two fully licensed (by 1960 all states and territories had statutes licensing both levels) levels, registered professional nurse (RN) and licensed practical nurse (LPN/LVN).

As stratification of nurses became more acceptable and bio-medical advances and technological developments altered the delivery of health care, growing specialization within nursing led to a movement to justify a university education for the top strata. A university education was often not available to students desirous of a career in nursing for a wide variety of economic, social and educational reasons, so in the 1950s the community colleges expanded the entry into nursing with the Associate Degree in Nursing (ADN) or Associate of Science Degree in Nursing (ASN) programs. This movement continued to flourish, and its rapid growth throughout the 1960s (Refer to Table 1. p. 14 ) led to a change in the character of American nursing. By 1972 ADN programs were largely replacing diploma programs, sounding the final death knell for hospital affiliated programs.

The differentiation of roles in practice settings between and among nurses of different educational preparation made it difficult for employers to identify who the "real" registered nurse was, and what were the parameters of her practice. It

also made employers reluctant to pay baccalaureate nurses higher salaries for their ability to function independently in the health care system. A major problem also existed in that ADN graduates did not see themselves as a different kind of nurse, nor did they view their education as terminal. In 1970 the National Commission for the Study of Nursing and Nursing Education published the first of a series of reports, An Abstract for Action, recommending more research in nursing education and practice, repeating the Brown Report recommendations for stratification, and additionally suggesting the development of a career ladder for facilitating mobility between the many education preparation levels of nursing.<sup>35</sup> Ultimately, this report led to the 1983 final Commission Report which again supported the continued upgrading of nursing education and the career ladder approach.<sup>36</sup>

### Feminist Literature

A Feminist Perspective. Nursing has been described by most theorists and researchers as a female dominated profession and occupation. It clearly is this; nurses are largely women workers (Refer to Figure 1.) However, it may make more sense to consider nursing as a category of women's work. Nursing has moved out of the private sphere of the home and voluntary community service to the public sphere of paid

labor. In its history nursing has evolved from hard physical labor to physically, intellectually, and technologically tough, demanding and challenging work. Nursing, like teaching, social work and librarianship should appropriately be studied in the context of women's work in the public sphere.

Nursing as women's work can be studied from a perspective which places women as the central focus of study. A feminist perspective is developed out of and in concert with feminism, feminist ideology, and feminist theory or rather feminist conceptual frameworks.

#### **Feminism and Feminist Conceptual Frameworks**

While there have been a number of these feminist theories explicated, no one of them can be rightly called a theory in the sense that Zetterberg (1965)<sup>37</sup> identifies the three routes to the construction of sociological theory. Feminist "theory" has much in common with family "theory" in sociology, in that they are both in the "process of becoming" and rest heavily on "borrowed theory" for their construction.<sup>38</sup> Feminist theories should more appropriately be termed feminist frameworks, because that terminology more correctly describes their stage of development. Recognizing that this is the "state of the art" at the moment, it is still possible to draw from feminist conceptual frameworks in order the feminist perspective.

**Feminism.** The concept of feminism is itself both a perspective on social reality as well as a social movement,



and its roots and consciousness have an historical basis and a social construction. Feminism and contemporary or modern feminism are almost impossible to satisfactorily define. Most definitions, however, share certain common components. First, feminism can be expressed as a belief in equality and equity among human beings. In essence this means an opposition to sexual stratification or a sexual hierarchy in society. It implies acceptance of responsibility in addition to the demand for rights. Second, feminism clearly distinguishes the biological category of sex from the social category of gender, emphasizing the purposeful and therefore alterable social construction of women's condition. Third, feminism places all social life within the context of social institutions. Women's culture and behaviour can be understood by the recognition of separate social realities, existing and coexisting, within social institutions. Social reality is essentially symbolic and emerges within the context of social situations. Thus, social realities are socially constructed; they are not predetermined. Fourth, although women perceive themselves as a biological group, they also identify themselves as a social group; for most women, there is a sense of gender identity. Feminism, then, posits a group gender identity. Lastly, feminism acknowledges the interconnection between individual lives and social historical occurrences, or in C. Wright Mills'<sup>39</sup> terminology, the connection between biography and history.<sup>40</sup>

Consistent with modern feminism and feminist conceptual frameworks, feminist ideology engages social systems and social institutions in the transformation of self and society, as well as the translation of the personal into the public, making the interaction of community and individual a part of the day to day socialization of human beings. Much of feminist ideology draws heavily on Marx, particularly on the dialectical relationship between consciousness and social structure. Feminist ideology takes as its core the insights of Marxist theory and then applies them to social relations. Taking a Marxist orientation helps feminism to refocus its view toward social relations, such as conflict and alienation. Class, race and gender divisions can then be seen as both distinct and interactive. Women are able to identify a common reality as well as a common oppression, noting that their experiences are different both within their particular class and gender, and because of it.<sup>41</sup>

**Feminist Ideology.** Feminist ideology also derives its ideological premise from twentieth century existentialism, rooted in the philosophy of Hegel, Husserl and Heidegger, and from Freudian insights into the nature of women's oppression. Josephine Donovan in her authoritative study of feminist theory<sup>42</sup>, following the lead of Jaggar and Rothenberg<sup>43</sup> who published a landmark theoretical account of feminist frameworks and their application, discusses the importance of existentialism and Freudianism in the development of

contemporary feminist theory. She focuses on the need for validation of women's social reality through the articulation of the truths which patriarchal frameworks have used to keep women ideologically subjugated. Expression of these truths, she notes, can give women the freedom to act as creative subjects rather than accepting their enforced traditional role as object. These truths have been well exposed by existentialism in Sartre's construction of the perpetual dialectic of the en-soi/pour-soi dyad and by criticism and critique of Freud's contributions to the psychosocial and psychosexual development of women.<sup>44</sup> Document II in Appendix A summarizes these contributions.

**The Development of Feminist Conceptual Frameworks.** Historically, feminist conceptual frameworks evolved out of and in response to the new theories of history, social change and social relations of 18th century Enlightenment liberalism and its 19th century critics. Eighteenth century liberal theory was an argument against what was identified as a patriarchal order of power and social relations. This patriarchal order did not focus on family, but rather on the relations between the class of ordinary men in society and the privileged monarchy and aristocracy, who held power over them. These patriarchal relationships were later seen as analogous to family relationships, and the principles of liberalism, the rejection of class distinctions created by birthright, were extended to cover the situation of women.

One of the first persons to make this connection was Mary Wollstonecraft (1759-1797) in her two important treatises, A Vindication of the Rights of Men (1790) and A Vindication of the Rights of Woman (1792).<sup>45</sup> In the former, she responded to Edmund Burke's conservative attack on liberal principles, while in the latter, she responded to Rousseau's planned program for the training and educating of women. She argued in A Vindication of the Rights of Woman that patriarchal relations between the sexes, based on the power of men over women, were as unjust as those power relations between monarch and subject. The existing situation of inequality between men and women, and woman's dependence on man, denying her a full measure of rationality, make it impossible for women to exercise their duties and thus develop moral virtues, which of necessity proceed from reason.

It is vain to expect virtue from women, till they are in some degree independent of men; nay it is vain to expect that strength of natural affection, which would make them good wives and mothers.....when a woman is admired for her beauty, and suffers herself to be so intoxicated by the admiration she receives, as to neglect to discharge the indispensable duty of a mother, she sins against herself;.....Men are not aware of the misery that they cause, and the vicious weakness they cherish, by only inciting women to render themselves pleasing; they do not consider that they thus make natural and artificial duties clash.....But to render her really virtuous and useful, she must not, if she discharge her civil duties, want, individually, the protection of civil laws; she must not be dependent on her husband's bounty for her subsistence during his life, or support after his death-.....But take away natural rights, and duties become null.<sup>46</sup>

Wollstonecraft also contended in this treatise that women are not demeaned or debased by anything inherent in their nature, instead the social forces to which women are subjected during their lifecourse render them less competent than their natural capabilities. Additionally, she saw the necessity for women to go beyond traditional training, which left them frivolous, empty-headed beauties unable to perform their basic societal duties, and seek education in order to broaden their horizons and improve not only their social condition, but the condition of the family and of society as a whole, as well.

The being who discharges the duties of its station is independent; and, speaking of women at large, their first duty is to themselves as rational creatures, and the next in order of importance, as citizens, is that which includes so many, of a mother.....But what have women to do in society? I may be asked, but to loiter with easy grace; surely you would not condemn them all to suckle fools and chronicle small beer! No, women might study the art of healing, and be physicians as well as nurses. And midwifery, decency seems to allot to them.....They might, also, study politics, and settle their benevolence on the broadest basis; for the reading of history will scarcely be more useful than the perusal of romances, if read as mere biography; if the character of the times, the political improvements, the arts, &c., be not observed. In short, if it be not considered as the history of man; and not of particular men, who filled a niche in the temple of fame.....Business of various kinds, they might likewise pursue, if they were educated in more orderly manner.....Women would not then marry for a support.....The few employments open to women, so far from being liberal, are menial;.....But in order to render their private virtue a public benefit, they must have a civil existence in the state, married or single; else we shall continually see some worthy woman, whose sensibility has been rendered painfully acute by some undeserved contempt, droop like 'the lily broken down by a plow-share'.....How

much more respectable is the woman who earns her own bread by fulfilling any duty, than the most accomplished beauty!.....Would men but generously snap our chains, and be content with rational fellowship instead of slavish obedience, they would find us more observant daughters, more affectionate sisters, more faithful wives, more reasonable mothers—in a word, better citizens.<sup>47</sup>

In this and her other written works, Wollstonecraft was urging equal opportunities and equal rights for women and for the betterment of humanity. Many early feminists supported her assertions about the education and status of women, and this liberal approach to explaining women's status became the basis for liberal feminist theory. However, it need be remembered that Wollstonecraft was addressing her remarks contextually. Her doctrine of equal rights for women addressed the problems of upper and middle class women of her era. It did not take into account the problems and needs of lower class or impoverished women, women who received no semblance of training and therefore no hope of betterment, let alone equality.

**A Liberal Feminist Conceptual Framework.** Today, liberal feminism, having developed from this liberal approach, argues that women, like men, are born equal, and that human progress depends on the creation of a more enlightened and rational society. For liberal feminists the key to social change is the progression of human history toward the development and use of reason and science as the basis for social and legal institutions. This social change is accomplished primarily

through education. Education stresses the creation of equal rights for both men and women within existing social relations and provides an understanding of how socialization is both the reason for the sex differences that exist and the instrument by which they can be changed. Thus, liberal feminism, based on this liberal tradition, sees society as a whole being harmed by the inequities between men and women, which are unjust and undemocratic, and further sees human progress as being restrained by men continuing to hold power over women, under the artificial constraints of law and social institutions. As Mill pointed out in The Subjection of Women:

What is now called the nature of women is an eminently artificial thing--the result of forced repression in some directions, unnatural stimulation in others.....The social subordination of women thus stands out an isolated fact in modern social institutions; a solitary breach of what has become their fundamental law; a single relic of an old world of thought and practice exploded in everything else, but retained in the one thing of most universal interest.....This entire discrepancy between one social fact and of those which accompany it, and the radical opposition between its nature and the progressive movement which is the boast of the modern world, and which has successively swept away everything else of an analogous character, surely affords, to a conscientious observer of human tendencies, serious matter for reflection.<sup>48</sup>

Liberal feminism and a liberal feminist conceptual framework, in its contemporary form, had a resurgence after the forty to fifty year hiatus, when the women's movement in America and American feminism were quieted after 1920. Feminism in all of its forms, liberal, cultural, and

Marxist/socialist entered its second wave with the 1963 publication of The Feminine Mystique by Betty Friedan and the 1965 formation of NOW (The National Organization for Women).<sup>49</sup> Many writers of the second wave took up the theme of women's differences from men as being the chief mechanism of their oppression set forth by Simone de Beauvoir in her analysis of women's subordination in The Second Sex. This theme was expressed in a variety of ways by both the more conservative and the more radical proponents of feminism, including Friedan, Millet, and Firestone, who sought changes in basic social arrangements.

Liberal feminism, although widely accepted today, has been criticized for being overly optimistic in assuming that humanity will progress simply because people have developed greater insights about themselves and their social condition. It has also come under fire for not providing strong causal connections between the conditions which have given rise to changes in women's status and women's emancipation. It is seen as weak historical theory, which does not account for synchronic changes in history or women's history. The liberal feminist conceptual framework is also apt to accept "schemes of periodization"<sup>50</sup> with regard to women's history, thereby, disconnecting the liberation of women from other historical, social, political and economic changes. Thus, while liberal feminist theory offers a powerful critique of inequality and useful ideas for change, it falls short as an explanation for



the historical and social developments of the relationships between men and women, and among women.<sup>51</sup>

#### **A Traditional Marxist Feminist Conceptual Framework.**

The traditional Marxist feminist conceptual framework<sup>52</sup> is an adaptation of the conflict perspective, which attempts to offer a more workable solution to the social ills that plague society by giving a more adequate understanding of how history and society work. Historically, this theory sees the locus of women's oppression as the introduction of private property. Women are seen as property, and the subjugation of women is seen as analogous to the ownership and control of other types of private property, including ownership of the means of production. As time has passed and sociologists have made advances in the development of theories about class and gender relations, the Marxist feminist conceptual framework, focusing on the dynamics of women's oppression, has come to confront new and serious theoretical and political issues which characterize any synthesis of Marxist and feminist perspectives, and, consequently, has expanded the analyses of women's oppression to include theories of social reproduction.

Traditional Marxist feminism took the orthodox Marxist view that the main source of women's oppression is women's role in making possible men's labor through the domestic division of labor.<sup>53</sup> By managing the home and caring for and nurturing men, women become totally subjugated. They are bowing to economic needs which extend capitalism into the home

and family. Out in the labor force women are also exploited as a marginal source of labor, being brought into and thrown out of the labor market, according to the economic needs of the capitalist system. Therefore, this perspective holds that the only way women can become liberated is, when working-class women and men join together to overthrow the economic structure which is the cause of women's oppression, the capitalist system. Any separate feminist movement is seen as contrary to the goals of true liberation.

Most Marxist feminists have moved away from this perspective, rejecting the argument that women's condition can be solely explained by oppression resulting from the existence of private property and a capitalist class structure.<sup>54</sup> Contemporary Marxist feminists seek to identify the operation of gender relations both as connected with and distinct from the processes of production and reproduction as understood by historical materialism. Traditional Marxist feminist theory saw true social justice as meaning economic equality without the perpetuation of inequalities of class or gender. The extension of these ideas by contemporary Marxist feminist theory includes an awareness of gender differences which preceded capitalism and which socialist revolution would not abolish. Historically, this means a contextual analysis of sexuality and an examination of three key concepts, patriarchy, reproduction and ideology.

While still retaining the essential elements of the theories of Marx as expressed in his writings including, The German Ideology (1846), Capital (1867) and Manifesto of the Communist Party (with Engels in 1848)<sup>55</sup>, contemporary Marxist feminism modified its approach by seizing upon the idea of praxis and using it as an educational tool to assist women in learning about and becoming aware of their oppression. The use of "consciousness-raising" groups in the 1960s and 1970s gave women the opportunity to expunge false consciousness and move toward fundamentally changing their environment. This use of praxis emerged from the Marxist feminist analogy between women and the proletariat and encouraged women to shed patriarchal ideologies which serve only male interests and develop a true consciousness which allows opposition to the ruling ideology. An extension of the concept of praxis in industrialized American society gives it positive vision or a sense of individual change, permitting women to experience free creative expression in interaction with society. Women can then humanize society by developing a fulfillment in their work and rejecting the transformation of workers into commodities, which alienation and consequent reification would create in capitalist society.

The relationship between worker alienation, which Marx saw as extending into all areas of social life, was rooted in the primary division of labor occurring within the context of the family. Based on Marx's theory of economic value which

distinguishes Marx's unique analysis of surplus value, Engels extended his analysis of the location of the oppression of women to the emergence of commodities used for exchange and profit, resulting from the establishment of private property under patriarchy.<sup>56</sup> This location of alienated labor within the modern industrial family, and Engels' anomalous solution, women's movement into the public labor force and the communalization of private production in order to counteract oppression, became the focus of "the woman question". Attempts to resolve this question, to identify the connection between production and reproduction, and develop a satisfactory Marxist feminist theory of women's oppression, have occupied both traditional and contemporary Marxist feminists and have provided the central concern for the development of socialist feminism, which developed within the framework of contemporary Marxist feminism as a critique of liberal feminism and as a response to radical feminism's attack on all existing theoretical systems' attempts to articulate a theory of women's oppression.

Barrett (1988), Eisenstein (1983), and Kuhn and Wolpe (1978) discuss this work in detail, presenting comprehensive analyses of the historic subordination of women as a fundamental aspect of Western civilization.<sup>57</sup> Briefly, as Marxist feminist theory moved beyond Shulamith Firestone's reconstruction of Marx and Engels' theory of historical materialism<sup>58</sup>, identifying the basic division in society as

one of 'sex class' rather than economic class, the concept of patriarchy began to take on less of the quality of a universal oppression and a general male dominance and more of a sense of historical specificity. As the concern over the construction of male dominance led to the question of the location of women's oppression within biology or culture, there arose the more basic question of women's economic roles intersecting women's 'sex' roles.<sup>59</sup> Sex roles were themselves seen as a form of oppression, keeping women restricted and limited not by visible coercion by the rule of men, but rather through the continued reproduction of an ideology that reinforced a separation between male and female roles and the subordination of women, individually and collectively. Thus, reproduction signified both biological reproduction and social reproduction, or the need of any social system to reproduce its own conditions of production, i.e. the organization of production in society(ies). The tendency within the socialist feminist branch of contemporary Marxist feminism to remove the location of women's oppression from the level of ideology fostered a rejection of economic arguments, and made it possible to accept the idea that the oppression of women can be a relatively autonomous element of social reproduction. With this expanded perspective, socialist feminism developed into a feminist perspective of its own, concentrating on analyses of representations of gender difference in terms of cultural production and social reproduction.<sup>60</sup>

**A Socialist Feminist Conceptual Framework.** Socialist feminists criticized traditional Marxist understanding of "the woman question", and argued that liberal feminists did not account for the sources and processes of women's oppression, leading them to develop unworkable strategies for change. Further, while accepting the methodology of historical materialism and combining it with the concept of praxis in order to extend the method to consciousness raising, socialist feminists departed from contemporary Marxist feminists by utilizing the concept of praxis to justify the development of alternative social arrangements and the establishment of a woman's culture. Inherent in the socialist feminist perspective is the belief that women's culture can provide the basis for feminist opposition to patriarchal ideology. "The woman question"<sup>61</sup> for socialist feminism implies a restructuring of social institutions, such as the family and the work setting, to ensure not only individual rights, but also to provide social structural elements which assure responsible social relations. These social relations must take into account the inseparability of gender and class oppression, as they impinge upon women, and redirect destructive patriarchal ideologies and practices which have heretofore made it impossible for women to develop their own interests, activities and culture. In essence socialist feminism focuses on social relations and suggests that the structure of social arrangements should be questioned and

changed, not just to eliminate inequities, but more importantly to prevent alienation from creativity and to humanize society.

**A Radical Feminist Conceptual Framework.** As contemporary socialist feminism moved beyond Firestone's articulation of a new and expanded definition of historical materialism which posited a materialist base resting on reproductive biology, so too did radical feminists. Firestone herself, led this movement in declaring that feminist issues were not only women's first priority, they were the major priority.

The contemporary radical feminist position is the direct descendent of the radical feminist line in the old movement, notably championed by Stanton and Anthony.....It sees feminist issues not only as *women's first priority*, but as central to any larger revolutionary analysis. Its refusal to accept the existing leftist analysis is not because it is too radical, *but because it is not radical enough*: It sees the current leftist analysis as outdated and superficial, because this analysis does not relate the structure of the economic class system to its origins in the sexual class system, the model for all exploitative systems.....<sup>62</sup>

Radical feminism was born out of reaction and response to the other theoretical perspectives; it was essentially social movement rhetoric organized into a body of knowledge for "second wave" activists and proponents. Radical feminist theory was an entirely new form of feminism which held that the oppression of women was fundamental and had not been properly addressed by other feminist theories. Radical feminists defined sexuality and relations between the sexes

as central to the perspective and its application. Social institutional arrangements were seen as patriarchal, benefitting only males. Men were identified as the problem and women, women united in a collaboratively constructed culture, provided the solution. Woman's self-identification, beyond the unifying element of gender, held great appeal and formed the basis for a new ideology.

This new ideology cast patriarchy as the root of women's oppression, not capitalism, and radical feminists viewed women's culture as the basis of any future society. The New York radical feminist group, spearheaded by Ti-Grace Atkinson, issued a series of position papers in 1969. These papers articulated the radical feminist thesis of patriarchal oppression as seen in male/female roles and sought the rejection of the institution of marriage "both in theory and in practice".<sup>63</sup>

Later that year another New York group formed, including Firestone, Koedt and Crothers, and in 1970 they issued a manifesto, articulating the radical feminist thesis which identified women's oppression as rooted in psychological factors:

We believe that the purpose of male chauvinism is to obtain psychological ego satisfaction, and that only secondarily does this manifest itself in economic relationships. For this reason we do not believe that capitalism, or any economic system, is the cause of female oppression, nor do we believe that female oppression will disappear as a result of purely economic revolution.<sup>64</sup>



Women were encouraged to rebel against patriarchy and to discover their own feelings, develop their own opportunities, and create their own culture separate from that of men. Since their interests, opportunities and culture were differentiated from men's, women were further encouraged to establish their own personal subjective issues, starting with gaining control of their own bodies and liberating them from male domination in order to engage in shared experiences with other women. The idea that the "personal is political"<sup>65</sup> became the watchword, and radical feminists advocated a separatism from males, not only a sexual separation but a separation from the imposition of male ideology, male culture, and male dominated institutional arrangements.<sup>66</sup>

Radical feminist strategies, based on radical feminist theory and opposed to patriarchal ideology, male supremacy and female subjugation in society, called for enforced separation from the dominant patriarchal culture in all social institutions, including the home and the work setting. Radical feminism espoused the creation of alternative social institutions which would recover the devalued aspects of women's culture.

These tenets were set forth most clearly in Kate Millet's Sexual Politics (1968), Shulamith Firestone's The Dialectic of Sex (1970), Ti-Grace Atkinson's Amazon Odyssey (1974), and Mary Daly's Gyn/Ecology (1978).<sup>67</sup> All of these works were revolutionary documents which urged women to put an end to

reproductively engendered sexual divisions as well as cultural divisions. Women should no longer be defined by society in terms of the functions that they fulfill, but rather develop a new identity, grounded in creativity and autonomy, distinct from the political identity imposed by a patriarchal culture. For radical feminists, political identity and personal identity should be one and the same, emanating from political institutions defined by women's culture.

The four major feminist conceptual frameworks, liberal feminism, Marxist feminism, socialist feminism and radical feminism, have spawned, either singly or in concert, a number of offshoots. These subsidiary approaches are generally issue focused rather than conceptually base. Included in this group are lesbian feminism, feminism for women of color, cultural feminism and social feminism. Document III in Appendix A summarizes these perspectives.

Using A Feminist Perspective in Research. This exploratory study will use a feminist perspective, notably ideas from the socialist feminist conceptual framework, in original research on nurse supply from 1870-1988. The feminist ideas, feminist concepts and feminist ideology of this researcher are part of her value system. They will not affect the objectivity of the scientific research, but they will intrude on both the development of the hypotheses and the interpretation of the findings.

Scientific research in any discipline may be conducted from a feminist perspective. Much research from a feminist perspective is linked with research done by sociologists. As Oakley points out, this has not always been a positive relationship.<sup>68</sup> Sexism in sociology has contributed to Oakley's conception of the "invisible woman".<sup>69</sup> However, as work continues to be done, this situation appears to be changing. Feminists, as sociologists, are approaching the research process with new awareness.

Feminist sociologists are going forward to investigate empirical "women's questions" from a non-sexist framework, which "takes women into account" and makes "women visible" in the research findings. Traditional approaches to the study of health care have often failed to clearly show how women "fit into" the health care system. The importance of women's experience is one of the central themes of feminism. Since work in the health care setting is largely women's work, this is an ideal area empirical research to be informed by feminist conceptual frameworks.

This research will place women at the center not only of the health care system, but at the center of the analysis as well. In this research the the feminist conceptual framework of socialist feminism, as well as element of other feminist conceptual frameworks, will be intergrated with sociological theory and applied to both framing the research questions, or stating the hypotheses, as well as informing the

interpretation of the findings. By asking questions which require an understanding of women's work experience and by interpreting the analyses with an appreciation of women's contributions to American labor history, we can truly "read the data story" of women in the health care system.

## CHAPTER II ENDNOTES

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2. Patricia A. Jones, "Nursing Shortage: A Caring Shortage," Caring (May 1988): 15.

3. J. Reid and L. J. Rodgers, "Career Choice and the Supply of Nurses," in The Recruitment Shortage of Registered Nurses United States Department of Health and Human Services. DHHS Publication Number (HRA) 81-32 (Washington D. C.: U. S. GPO, 1981).

4. United States, Bureau of Education, Training Schools for Nurses Circulars of Information (Washington, D. C.: U. S. GPO, 1879);

United States, Bureau of Education, The Inception, Organization, and Management of Training Schools for Nurses Circulars of Information (Washington, D. C.: U. S. GPO, 1882) 1-28.

5. Three important schools, all destined to influence modern nursing in accordance with Florence Nightingale's principles of nursing and nursing education, appeared almost simultaneously in the early 1870s. In 1873 the Bellevue Hospital School of Nursing was organized under the direction of the New York State Charities Aid Commission and operated according to Miss Nightingale's system. Languishing since 1861, the New England Hospital for Women and Children in Boston was reformed in 1872 following the English methods learned from Miss Nightingale. The Connecticut School at New Haven Hospital was organized independently of the hospital, which then served as its field site for practical training. It opened its doors to pupils in 1873 and shortly thereafter published the New Haven Manual of Nursing, a comprehensive text, detailing nursing educational practices.

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18. Yett, 3.

19. Yett, 3.

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41. Feminist ideology and its strong identification with Marxist theory is described at length in Michele Barrett, Women's Oppression Today: The Marxist/Feminist Encounter Revised Edition (London: Verso, 1988) particularly in Chapters 3, 5 and 7; and in Kelly, Women, 1984, especially in the Chapter 3 reprint of her article, "The Doubled Vision of Feminist Theory".

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46. Wollstonecraft, A Vindication of the Rights of Woman, 213-214.

47. Wollstonecraft, A Vindication of the Rights of Woman, 218, 221-222, 219-220, 224.

48. Mill, The Subjection of Women, 240, 237.

49. Betty Friedan, The Feminine Mystique (New York: W. W. Norton & Company, Inc., 1963);

It is important to remember that, while feminism and the feminist movement appeared dormant in the United States following its high point between 1890 and 1920, European feminists, particularly in England, France and Germany, were continuing to write and advocate for women's rights, especially in the labor force, during this transitional era between the "old and the new", or the "first and the second wave" [of] feminism.

50. This terminology was used by Joan Kelly in her reprinted chapter in Women, History, and Theory, 19-50, to designate the traditional historical approach to women's history, an approach that uses the emancipation of women as a vantage point for the examination of the historical developments of women apart from other historical occurrences.

51. For a general overview of feminist thought, see: Alice S. Rossi, ed., The Feminist Papers: From Adams to de Beauvoir (New York: Columbia University Press, 1973) and Joan Kelly's essay, "Early Feminist Theory and the *Querelle des Femmes*, 1400-1789," reprinted in Women, 1984, Chapter 4.

52. See Barrett, 1988; Kelly, 1984; Donovan, 1985; Jaggar , and Rothenberg, 1984; and Catharine A. MacKinnon, "Feminism, Marxism, Method, and the State: An Agenda for Theory" in Nannerl O. Keohane, Michelle Z. Rosado, and Barbara Gelpi, eds., Feminist Theory: A Critique of Ideology (Chicago: The University of Chicago Press, 1981) for discussions of traditional and contemporary Marxist feminism.

53. The natural division of labor rooted in the family and the oppression of women is discussed in Marx's theories in Karl Marx, The German Ideology edited by R. Pascal (New York: International Publisher, 1947) originally published in 1846; Karl Marx, Capital Vol. I (1867), Vols. II (1885) and III (1894) edited by Frederick Engels; and Engels, 1985.

See also Ernst Fischer, ed., The Essential Marx (New York: The Seabury Press, 1970).

54. See Barrett, 1988; Kelly, 1984; Donovan, 1985; and Jaggar and Rothenberg, 1984.

55. Marx, The German, 1846; Marx, Capital, 1867; Karl Marx, and Frederick Engels, The Manifesto of the Communist Party (Moscow: Progress Publishers, 1952) originally published in 1848.

56. In Engels, 1985 Origin of the Family Engels draws upon Marx's economic theories, especially those in Capital.

57. Barrett, 1988; Hester Eisenstein, Contemporary Feminist Thought (Boston: G. K. Hall & Co., 1983); Annette Kuhn, and AnnMarie Wolpe, eds., Feminism and Materialism: Women and Modes of Production (London: Routledge and Kegan, 1978).

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59. As H. Eisenstein (1983: 5-14) points out, the term sex role/sex roles in sociology is innocuous and devoid of any value-laden meaning. It simply refers to the fulfillment of appropriate social functions by males and females, as designated by family sociologists, such as Talcott Parsons in the 1950s. When used by contemporary feminists, however, the term takes on a potentially explosive set of meanings. Kate Millet, 1969 and Elizabeth Janeway, Man's World, Women's Place: A Study in Social Mythology (New York: Dell Publishing Company, 1971) transformed the meaning of sex roles from the conventional meaning of a social roles dictated by the biological sex of the actor to a role assigned to an actor because of gender associated behaviour linked more or less arbitrarily by society with that biological sex. To Millet and Janeway and other feminists, roles assigned because of biological sex were a form of oppression, limiting and restricting women in society.

60. For further indepth analysis of the differences between traditional Marxist feminism, contemporary Marxist feminism, socialist feminism, and radical feminism see: Barrett, 1988; Donovan, 1985; Jaggar and Rothenberg, 1984.

Socialist feminist theory, while accepting the methodology of historical materialism, rejected Marx's notion of universal oppression of women. Socialist feminism saw sexism as being as fundamental as economic oppression and looked to eliminate this double oppression of institutionalized class and gender discrimination in capitalist society by altering the structural elements of social institutional arrangements. This idea is explained and discussed in detail in Zillah R. Eisenstein, ed., Capitalist Patriarchy and the Case for Socialist Feminism (New York: Monthly Review Press, 1979) particularly the essays by Z. Eisenstein (5-55), Hartsock (56-82), Gardiner (173-189), and Hartmann (206-247); further discussion and feminist critique are presented in Beyond the Fragments: Feminism and the Making of Socialism by Sheila Rowbotham, Lynne Segal, and Hilary Wainwright (London: Merlin, 1979).

61. "The woman question" under communist theory, Marxist theory and traditional Marxist feminism is seen as Bebel described it, meaning that the solution to the question of women under socialism and communism was identical to the solution of the social question. Contemporary Marxist feminism and socialist feminism do not see entrance into the work

setting in the public sphere and the subsequent communalization of private production as true emancipation for women, as Engels outlined. The movement from relatively unalienated labor to the realm of alienated labor seems at odds with both Marx's theories of alienation and any sense of liberation from oppression under capitalism. Consequently, both perspectives have theoretically readdressed "the woman question", endeavoring to explain the material source of women's oppression in patriarchy and not in capitalism. Their focus has, therefore, been the domestic sphere or the role of the household in capitalist society. Socialist feminists, in particular, focus their concerns on the relationships between women and wage labor, women and social class, and the socializing role of the family under capitalism.

62. Shulamith Firestone, The Dialectic of Sex: The Case for Feminist Revolution, (New York: Bantam Books, 1970): 37.

63. Donovan, 1988 chronicles the history of radical feminism, directly recounting the experiences and writings of the New York feminists. She takes this quote, reprinted in its entirety (143), directly from the position papers of the New York Radical feminist group.

64. This manifesto prepared by Anne Koedt was entitled "The Politics of the Ego: A Manifesto for New York Radical Feminists". It was originally published in Notes from the Second Year (1970) 24, and was reprinted in Donovan, 144.

65. This idea was discussed in Donovan, 141-142 as well as in many other sources which dealt with radical feminist theory. No source used in this paper identified the originator of the idea.

66. For further discussion of radical feminism see: Donovan, 1988; Jaggar and Rothenberg, 1984; H. Eisenstein, 1983; Zillah R. Eisenstein, The Radical Future of Liberal Feminism (Boston, MA: Northeastern University Press, 1981); Firestone, 1970; Millet, 1969; and Daly, 1978).

67. These sources were identified by Donovan, 1988 and Jaggar and Rothenberg, 1984.

Ti-Grace Atkinson, Amazon Odyssey (New York: Links, 1974).

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69. Oakley, 1-28.

## CHAPTER III

### METHODS: DATA COLLECTION, DEFINITIONS, HYPOTHESES

Data tell a story, and it is the role of the researcher to discover parts of that story.<sup>1</sup> To date studies of nurse supply have produced a vast literature and a series of complex empirical models, as well as extensive anecdotal accounts and historical analyses. Women's labor force participation has not figured prominently in many of these studies; the major exceptions being studies of nurse mobility (Altman, 1972), nurse inactivity (Sloan, 1975, 1978), and husband's employment and income (Cleland, 1971)<sup>2</sup>. This exploratory analysis examines major trends in nursing from the feminist perspective of nursing as women's work. The major assumption is that trends in nursing are associated with women's labor force participation.

#### Data Collection

##### Sources of Data

Data were collected from seven major public sources: published historical and anecdotal accounts; United States Department of Commerce Bureau of the Census Historical Statistics of the United States Colonial Times to 1970,

decennial census reports; United States Department of Labor bulletins and employment reports; National Center for Health Statistics reports; United States Department of Health and Human Services (formerly the Department of Health, Education and Welfare) supply surveys on nursing and health manpower; the American Medical Association and the American Hospital Association annual reports; the National League for Nursing surveys and annual inventories and the American Nurses' Association annual national sample surveys and annual inventories. Additional data were collected from both government and private surveys and public reports.<sup>3</sup>

All data collected are from public sources and in no way infringe on the rights of individuals, therefore, protection of human subjects is not an issue.

Data on the 120 variables in Table 3. were collected by year for the years 1870, 1880, 1890, 1900-1988 (N=92). Those variables used in the analyses are starred by usage. Variables' sources and description are given in Appendix B.

#### Quality of Data

The quality of the data must be considered with regard to availability, accuracy, and consistency. Complete data were not available on all 120 variables for each case, and in some years there were several data sources available with differing

TABLE 3. Major Variables

N=92 Cases are years 1870, 1880, 1890, 1900-1988

Variables are starred (\*) to indicate use in the analyses.  
Key: \* used in time plots; \*\* used in scatterplot matrices  
 (may also be used in time plots); \*\*\* used in multiple  
 regression and residual plot analyses (may also be used in  
 time plots or scatterplot matrices).

VARIABLE LIST

V1***	year
V2*	number of schools of nursing (RN)\total
V3*	number of nursing programs(RN)\total
V4*	number BSN programs
V5*	number ADN programs
V6*	number of Diploma programs
V7***	total number of active professional registered nurses (full and part-time)/100k population
V8*	estimated total number of registered nurses employed in nursing
V9*	estimated resident civilian population\in 1k
V10*	number of nurses enrolled in nursing programs(RN)\total
V11***	number of nurses graduating from nursing programs(RN)\total
V12*	FTE/100k population for all registered nurses
V13*	percent of married nurse employed full time in nursing
V14*	percent of married nurses employed part-time in nursing
V15*	number of auxiliary personnel employed in hospitals
V16*	number of doctoral programs in nursing
V17*	number of MSN programs
V18*	number of MSN graduates\calendar year
V19*	number of LPN/LVN programs
V20*	number of admissions to LPN/LVN programs
V21*	number of students enrolled in LPN/LVN programs
V22***	number of graduates from LPN/LVN programs
V23*	hospital vacancy rate for RNs in reporting non- federal hospitals
V24*	percent black/minority nurses
V25*	number of black nursing programs
V26*	number of black/minority nurses
V27*	marriage rate/1k population
V28*	divorce rate/1k population



V29\* total fertility rate/1k women in a lifetime with  
 intrinsic rate of natural increase  
 V30\* birth rate/1k women  
 V31\* number of nurses of immigrant stock (first  
 generation)  
 V32\*\* total national health expenditures per capita in  
 dollars  
 V33\* total national health expenditures per cent GNP  
 V34\* total number of medical hospital facilities (non-  
 federal)  
 V35\*\*\* total resident population 65 years and over\in 1k  
 V36\*\*\* total number of Health Maintenance Organizations  
 (HMOs)  
 V37\*\*\* hospital occupancy rate  
 V38\* number of registered nurses admitted as immigrants  
  
 V39\* percent married nurse not employed in nursing  
 V40\* per cent of the population covered for specified  
 benefits by private health insurance  
 V41\* per cent female physicians  
 V42\*\*\* estimated total number of LPNs/LVNs employed in  
 nursing  
 V43\* estimated total number of auxiliary health  
 personnel(aides, orderlies, attendants, etc.)  
 V44\*\*\* number of female high school graduates\in 1k  
 V45\*\*\* number of female baccalaureate degree graduates\in  
 1k  
 V46\* number of female PhDs  
 V47\* number of reported AIDS cases  
 V48\*\* number of licensed nursing homes\nursing home  
 facilities  
 V49\* per cent female PhDs  
 V50\* number of elementary and secondary school teachers  
 V51\* per cent female elementary and secondary school  
 teachers  
 V52\* number of hospital beds\in millions  
 V53\* number of hospital admissions\in millions  
 V54\* average length of patient stay in non-federal short  
 stay hospitals (excludes newborns)  
 V55\* estimated total number of hospital personnel\in 1k  
 V56\* estimated total number of hospital personnel/100  
 patients  
 V57\*\*\* number of nurses employed by highest credential-  
 ADN  
 V58\*\*\* number of nurses employed by highest credential-  
 BSN  
 V59\* number of nurses employed by highest credential-  
 MSN  
 and above  
 V60\* number of full and part-time licensed practical  
 nurses employed in hospitals  
 V61\* unemployment rates-RN

V62\* unemployment rates-LPN  
 V63\* unemployment rates-auxiliary health personnel  
 V64\* per cent distribution of the labor force-per cent female  
 V65\* unemployment rates-women 25-54  
 V66\* number of students enrolled in Diploma nursing programs  
 V67\* number of students enrolled in ADN programs  
 V68\* number of students enrolled in BSN programs  
 V69\* number of graduates from Diploma programs  
 V70\*\*\* number of graduates from ADN programs  
 V71\*\*\* number of graduates from BSN programs  
 V72\* per cent male registered nurses  
 V73\* number of admissions to all RN programs  
 V74\* number of admissions to Diploma nursing programs  
 V75\* number of admissions to ADN programs  
 V76\* number of admissions to BSN programs  
 V77\* estimated number of registered nurses not employed in nursing  
 V78\* per cent of RNs employed in nursing full time  
 V79\* per cent of RNs employed in nursing part time  
 V80\*\*\* average monthly full time RN salary  
 V81\* average monthly full time female teacher (elementary and secondary school) salary  
 V82\*\*\* average monthly full time salary of female professional or technical worker  
 V83\*\*\* average monthly full time salary of all female workers  
 V84\* total federal financial support to undergraduate RN programs\in 10 millions  
 V85\* per cent female civilian non-institutional labor force-16 years and over  
 V86\*\*\* total female civilian non-institutional labor force\by 1k-16 years and over  
 V87\* per cent female civilian labor force employed-16 year and over  
 V88\* per cent female civilian labor force unemployed-16 years and over  
 V89\* female labor force participation rate-20-24 years  
 V90\*\*\* female labor force participation rate-25-34 years  
 V91\*\*\* female labor force participation rate-35-44 years  
 V92\*\*\* female labor force participation rate-45-54 years  
 V93\* female labor force participation rate-55-64 years  
 V94\* number of full time registered nurses employed in nursing homes  
 V95\* number of full time licensed practical nurse employed in nursing homes  
 V96\* number of nursing home residents  
 V97\* total number of new RN licenses  
 V98\* total number of RN licenses by endorsement  
 V99\* total number of RN licenses by reinstatement

V100\* total number of new LPN/LVN licenses  
V101\* death rate-heart disease  
V102\* death rate-cancer  
V103\* Consumer Price Index-total health expenditures  
V104\* hospital (total) average daily census (inpatients  
excluding newborns\in 1k  
V105\* total number of women not in the labor force-16  
years and over

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counts. In all instances the most accurate figures or the most appropriate counts were used<sup>4</sup>, supplemented when necessary from the United States Department of Health and Human Services Historical and Estimated Data for the U. S. Health Sector 1949-1976.<sup>5</sup>

Data from the U. S. decennial census were used for constructing most variables, as it provides the best historical data source available. Prior to 1950 interviews were the primary data collection technique for decennial census data collection. These data, compiled before 1950, were subject to inaccuracies, specifically underenumeration. As problems were discovered, later census data became more reliable with underenumeration decreasing steadily after 1940.

Data on nurse activity were subject to additional inaccuracies. Early decennial census reports, prior to 1930, often included student nurses and unlicensed nurses in counts of employed nurses. Nurses, as census respondents in these early census reports, were also likely to overstate their actual level of achievement, due to misinterpretation of census data interview questions. This misinterpretation was based largely on the lack of regularized standards for practice. The result of these inaccuracies was an overenumeration of nurses. This overenumeration is estimated to be between 15 to 25 percent of the true value.<sup>6</sup>

When questionnaires replaced interviews for data collection after the 1950, data became more complete and accurate. However, problems still existed with the collection and use of nursing data and female labor force data.

Nursing Data. Nursing data, based on employer counts in contrast to inventory data, are a more accurate measure of nurse labor force participation. Employer counts are less likely to overestimate the number of nurses working in nursing, because they are more sensitive to actual level of nurse proficiency, nurse mobility, part-time status of nurses, and periods of nurse inactivity.<sup>7</sup> These data, collected by various health care organizations and the federal government, have been the most reliable and widely used sources of data since the early 1950s.

In 1949 the federal government established the Division of Nursing Resources (renamed the Division of Nursing in 1960) to oversee the quality and efficiency of nursing care and to assure proper utilization of nursing resources. The Division directed states to conduct surveys of nursing needs and resources and issued a manual containing a plan for data collection and analysis of nursing resources.<sup>8</sup> The manual was revised and the methodology refined and expanded in 1956 and again in 1972.<sup>9</sup> During this period, state surveys provided the major source of nurse supply data.

At about this time other sources of state and national data on nurse characteristics and nurse supply became

available through the American Hospital Association (AHA), the American Medical Association (AMA), American Nurses' Association (ANA) in 1949, the Interagency Conference on Nursing Statistics (ICONS) in 1953, and the National League for Nurses (NLN). These sources provided employer count data in contrast to the inventory data collected by the U. S. Census. Prior to 1950 decennial census data were used in most studies of nurse activity, as they were the most complete and reliable. Estimates of nursing requirements from 1950 to the present have utilized AMA, AHA, ICONS, ANA and NLN data, as well as other more recent sources of data.

By far the most reliable and most widely used current source of data, since the early 1960s, have been the federal government nurse supply surveys initiated in 1962. Most recently data have been available to researchers from the 1977, 1980, and 1984 national sample surveys of registered nurses and the 1983 survey of licensed practical (LPN) or licensed vocational nurses (LVN).<sup>10</sup> Additional federal sources of data and data published annually by both the ANA and the NLN<sup>11</sup> supplement the basic sources of summary data on the United States nurse population.

While the supply surveys are employer count data, the ANA and NLN sources are largely inventory data. After 1950, inventory decennial census data on nurse activity, particularly nurse supply, is subject to the following problems: the decade period between consecutive data

collection efforts is considered too long to insure accuracy; availability of decennial census data is delayed until months after collection, causing a time lag in use; census definitions of nurse employment, while similar to ANA definitions regarding licensure criteria, do not take into account periods of voluntary full or part-time inactivity; census data collected at a national level do not reflect licensure by endorsement or multiple state licensures. In summary, census data are a less complete public use sample compiled to develop national characteristics. ANA and NLN data collected under the regulatory authority of state licensing agencies at the state level, can be regarded as a more complete census of all currently licensed nurses.<sup>12</sup> These data can be aggregated to give an accurate national count of licensed nurses. Therefore, ANA and NLN inventory data are preferred to the census inventory data on the basis of completeness and quality.

For this study nursing education, nurse requirement and availability variables were taken from ANA and NLN sources, as well as the 1977, 1983 and 1984 national sample surveys, and the 1983 survey of LPNs, as indicated in Appendix B.

Female Labor Force Data. Similarly, information collected by the decennial census is not always consistent with data collected for the U. S. Department of Labor. For example, female labor force data are collected by both the decennial census and the Department of Labor, using similar definitions,

but the labor force rates differ. Typically rates obtained from the census are slightly lower than those obtained from the Department of Labor. Major trends in labor force participation appear regardless of source, but Labor Department data are seen as more sensitive to year to year readings of labor force patterns.<sup>13</sup>

U. S. Department of Labor statistics are derived from the Bureau of the Census Current Population Survey (CPS). The CPS is composed of monthly surveys of the population using a scientifically selected sample of 60,000 households designed to represent the civilian noninstitutional population. These surveys are analyzed and published monthly in Bureau of Labor Statistics publications, Employment and Earnings and Monthly Labor Review. Additionally, the surveys are repeated annually and corrected for seasonal variation. This data source is also supplemented by special inquiries, either monthly, quarterly or annually, which report on specific population characteristics and segments. The Women's Bureau of the Department of Labor periodically documents changes in women's labor force activity and publishes the findings of all relevant government research on women workers in its Handbook on Women Workers series.

While decennial census data provide a great variety of information on women's labor force activity, this information is often not current and does not reflect incremental patterns of change within and across decades. U. S. Department of Labor



data on female labor force participation is devoted to monitoring the labor force and recording smaller incremental changes in labor force participation rates. Therefore, Department of Labor data is considered a superior data source. When available, Department of Labor data were used in preference to U. S. Census data in this study, as indicated in Appendix B.

### Definitions

The definition of nursing accepted by all state licensing boards and all nursing organizations is stated in the 1980 ANA policy statement: "Nursing is the diagnosis and treatment of human responses to actual or potential health problems."<sup>14</sup>

The legal authority for nursing practice is state boards of nursing. The scope of nursing practice is defined by the ANA as the application of nursing theory through the use of the nursing process to meet the standards of nursing practice.<sup>15</sup> The ANA Standards of Nursing Practice specify the education and skills of the nurse and the level of her practice.<sup>16</sup>

### Nursing Education Variable Definitions

Nursing is stratified into two occupational groups, licensed registered nurses (RNs) and licensed practical nurses

(LPNs). Registered nurses are further stratified into two categories and three levels by the ANA and the NLN: the professional nurse, who possesses a baccalaureate degree in nursing (BSN); and the technical nurse, who possesses either an associate degree in nursing (ADN) or a diploma in nursing. Table 4. defines each type of nurse, summarizes the educational and licensure requirements for each group, and states their legal functions and responsibilities according to ANA policy guidelines. The table also identifies and defines the major nursing education variables used in the analyses.

#### Nurse Supply Variables

Having defined and described nursing and nurses leads to the companion questions: "How many nurses are there?" and "How many nurses are enough?". It is necessary to know how many nurses are actually working, and how many could potentially be employed. It is also important to know the breakdown of nurses working or available to work by educational preparation. The answers to these questions may be based on empirical data, expert judgement, or ethical standards. This study uses only empirical data to address the questions.

In order to develop hypotheses and analyze data which may provide the answers to these questions, the terms describing nurse supply must be defined, as they are currently used in

the literature. The major studies reviewed in Chapter 2. use the terms requirement and availability as generic terms to represent aspects of other concepts, such as, supply, demand, need, and wants. These terms, when properly defined, may be translated into observable and measurable variables.

Requirement and Availability. In most studies of nursing activity the concept of economic supply, referring to the number of nurses available to participate in the workforce, is not used. Instead requirement, referring to the total number of nurses actually employed in nursing at a particular time is used. Actual nurse supply is defined as requirement in this way, because nurses have historically been fully employed with a less than a 3% unemployment rate and an approximately 80% full time employment rate. Requirement reflects the actual labor force response of nursing to perceived economic demand. Requirement, as an endogenous or dependent (Y) variable, can be measured in either total number of active professional registered nurses employed in nursing (both full and part-time)/100k population or in full time equivalents (FTEs)/per 100k population [the number of nurses who worked full time added to half the number of nurses who worked part-time]. A measure of requirement answers the question "How many nurses are there?".<sup>17</sup>

Availability is defined as the number of nurses that are potentially employable at a given point in time. Availability is a measure of potential nurse supply. Availability reflects

**TABLE 4. Nursing Definitions and  
Nursing Education Variables  
(Selected)**

Nursing Education Variables	BSN Nurses	ADN/Diploma Nurses
	<u>Education</u>	<u>Education</u>
Number of Schools of Nursing: facilities housing nursing programs	4 year college curriculum, leading to BSN degree from state accredi- ted program;	2 year technical curriculum or 3 year curriculum leading to ADN degree or diploma in nursing from state accredited program;
Number of BSN Programs		
	<u>Licensure</u>	<u>Licensure</u>
Number of ADN Programs		
Number of LPN Programs	RN license from success- ful pass on state NCLEX exam;	RN license from success- ful pass on state NCLEX exam;
Nursing programs: basic education- al curricula for entry into nursing practice		
	<u>Functions</u>	<u>Functions</u>
	Professional Nurse; scope of practice limited only by evolution of professional curricular development; can practice as independent member of health team; role focuses on assisting patient to reach goal of	Technical Nurse; scope of practice limited by skills and patient population; can practice in controlled settings under supervision; role focuses on assisting patient with activities of daily living compro- mised by illness;

Table 4. continued

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wellness; formulates nursing care plan, makes nursing diagnosis.	follows nursing care plan developed jointly with BSN.
--	---

LPN

Education

1 year state  
accredited  
hospital  
based program;

Licensure

LPN licensure  
after successful  
pass on state  
exam;

Functions

looks after  
personal and  
physical needs of  
patient under  
RN supervision.

---

**TABLE 5. Major Dependent and Independent  
Variables  
(Selected)**

Independent Variables (X)	Nurse Requirement (Dependent) Variable (Y <sub>1</sub> )	Nurse Availability (Dependent) Variable (Y <sub>2</sub> )
Female HS graduates	Active RNs/100k population	Total RN Graduations
RN salary	BSNs employed	BSN graduations
Female Profession/ Technical Salary	ADNs employed	ADN graduations
	LPNs employed	LPN graduations
Female labor force participa- tion 25-34 yrs		
Number HMOs		
Population over age 65		
Hospital occupancy rate		
Female baccalaureate graduates		
Female labor force participation		
35-44 yrs		
Female labor force participation		
45-54 yrs		
Total female labor force participation		

the recruitment response of nursing to professionally perceived need. Availability, as an endogenous or dependent (Y) variable, can be measured in nursing program enrollments or graduations, or in number of new or existing nursing licenses. A measure of availability addresses the question, "How many nurses are enough?".

Table 5. identifies the requirement and availability variables used and the exogenous or independent (X) variables likely to be associated with them.

Economic demand, professional need, and want, as defined in Appendix B., are not directly measured in this study.

### HYPOTHESES

Sixteen *a priori* hypotheses were developed for this study:

1. Growth of nursing education programs leads to an increase in the number of nurses available to enter the workforce.

2. As salaries for female professional and technical workers increase, RN salaries increase.

3. Black and minority nurses are proportionally less active than white nurses in the RN category.

4. As the number of nurse immigrants increases, the number of nurses working in nursing increases.

5. The increasing number of part-time nurses in nursing has increased the ratio of nurses to consumer.

6. Nursing is becoming a "more married profession".

7. As the number of LPNs working in nursing homes increases, the number of RNs working in nursing homes decreases.

8. As national health expenditures increase, hospital occupancy rate increases, and female labor force participation increases, the number of nurses employed in nursing increases.

9. As female professional salary increases and the population of female workers aged 25-34 increases, the number of BSN nurses employed in nursing increases.

10. As the number of HMOs increases, the number of ADN employed in nursing increases.

11. As hospital occupancy rate increases and the number of population over age 65 increases, the number of LPNs employed in nursing increases.

12. As RN salary increases and number of female high school graduates increases, the number of nurses available to work in nursing increases.

13. As number of high school graduates increases and number of baccalaureate degree graduates increases, the number of BSN nurses available to work in nursing increases.

14. As female labor force participation rates for ages 35-44 and 45 to 54 increases, the number of ADN nurses available to work in nursing increases.



15. As the number of high school graduates increases and the total female civilian labor force increases, the number of LPNs available to work in nursing increases.

16. Trends in female labor force participation parallel trends in nursing labor force participation.

Nurse requirement and availability reflect nursing's response to perceived demand and need for nurses. This response further reflects major trends in American nursing. In turn these major trends in nursing labor force participation may be seen as a case study of women's work. Women's work in and out of the public sphere, known as the labor force, is historically and socially significant in that it focuses on the centrality of women as workers. It is well known that significant differences exist between men and women in the labor force. An analysis of trends in nursing will shed some light on the differences and similarities between women workers.

### CHAPTER III ENDNOTES

1. Hamilton, Modern, 3.

2. Altman, 1972; Sloan, Equalizing, 1978; Frank A. Sloan, United States, Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, Bureau of Health Manpower, Division of Nursing, The Geographic Distribution of Nurses & Public Policy DHEW Publication No. (HRA) 75-53 (Washington, D. C.: U. S. GPO, 1975); Virginia Cleland, Chapters 8 and 9 in United States, Department of Health, Education, and Welfare, National Institutes of Health, Part-Time Nurses: Recruitment, Utilization, and Retention of Part-Time Nurses in Voluntary, Non-Profit Short-Term Hospitals (Washington, D. C.: U.S. GPO, 1971).

3. Please see the Variable List in the Appendix which indicates the specific data sources for the 120 quantitative variables; other data sources will be identified in the text as the data are analyzed.

Examples of additional data sources include: Janet M. Hooks, United States, Department of Labor, Women's Bureau, Women's Occupations Through Seven Decades Bulletin Number 218 (Washington, D. C.: U. S. GPO, 1947); Linda J. Waite, U. S. Women at Work Population Bulletin Vol. 38 No. 2 (Washington, D. C.: Population Reference Bureau, 1981); Joseph A. Hill, Women in Gainful Occupations 1870-1920 Census Monographs IX (Westport, CN: Greenwood Press, 1929); Suzanne M. Bianchi and Daphne Spain, American Women in Transition National Committee for Research on the U. S. Census (New York: Russell Sage Foundation, 1986).

4. For example, from 1946-1953 data on number of hospitals, hospital ownership, average daily census and number of admissions were available from both AMA and AHA sources. Each source provided their specific established criteria (eg. minimum number of beds to classify a hospital) which explained their results. The researcher then chose the most appropriate source for her research needs. A similar situation exists when comparing slight discrepancies between ANA and NLN data on basic nursing education, ie. the NLN excludes American Samoa, Guam, Puerto Rico and the Philippines from its count.

5. United States, Department of Health and Human Services, Public Health Service, Health Resources Administration, Bureau of Health Profession, Division of Health Professions Analysis, DHHS Pub. No. (HRA) 81-1, Historical and Estimated Data for

the U. S. Health Sector 1949-1976 (Silver Spring, MD: Applied Management Services, Inc., 1980).

6. Jones, et al., 25.

7. Scott and Levine, 25-45; Bullough and Bullough, History, 56-61.

8. United States, Department of Health, Education, and Welfare, Public Health Service, Division of Nursing Resources, Measuring Nursing Resources (Washington, D. C.: U. S. GPO, 1949).

9. United States, Department of Health, Education, and Welfare, Public Health Service, Division of Nursing Resources, Design for Statewide Nursing Surveys (Washington, D. C.: U. S. GPO, 1956).

United States, Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Division of Nursing, Planning for Nursing Needs and Resources DHEW Publication No. (NIH) 72-87 (Washington, D. C.: U. S. GPO, 1956).

10. Aleda Roth, et al., United States, Department of Health, Education, and Welfare, Bureau of Health Professions, Division of Nursing, 1977 National Sample Survey of Registered Nurses (Springfield, VA: NTIS, 1978).

United States, Department of Health and Human Services, Public Health Service, Health Resources Administration, Bureau of Health Professions, Office of Data Analysis and Management, The Registered Nurse Population: An Overview-From National Sample of Registered Nurses November 1980. DHHS Publication No. HRS-P-83-1 (Revised November 1982) (Washington, D. C.: U. S. GPO, 1982).

United States, Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, Bureau of Health Professions, Division of Nursing 1984 The Registered Nurse Population: Findings From the National Sample Survey of Registered Nurses, November 1984 (Springfield, VA: NTIS, 1986).

United States, Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, Bureau of Health Professions, Division of Nursing National Sample Survey of Licensed Practical/Vocational Nurses, November 1983 (Springfield, VA: NTIS, 1985).

The national sample surveys collect information directly from individual nurses. In the Appendices of each sample survey the methodology is outlined in detail, including population surveyed, sampling techniques, response rate, etc.

11. The annual ANA Facts About Nursing and the annual NLN Data Book and other supplementary annual, biannual and periodic data sources are used. The number and type of federal data sources vary widely, each department of the federal government maintains an available up to date listing of titles currently in print. Out of date titles are available from federal depositories.

12. Jones, et al., 23-28.

13. Bianchi and Spain, 6-8.

14. ANA, Nursing, 9.

15. ANA, Nursing, 13; In the ANA, The Scope of Nursing Practice, 1987, the scope of clinical nursing practice is outline, and the differences between the scope of practice for the professional and the technical nurse are outlined.

16. ANA, Standards, 1973.

17. American Nurses' Association, Facts About Nursing 1986-1987 (Kansas City, MO: American Nurses' Association, 1987) 1-2.

## CHAPTER IV

### DATA ANALYSIS I: TIME PLOTS AND SCATTERPLOT MATRICES

The time series data were analyzed first explored graphically, using time plots and scatterplot matrices. Time plots are a simple yet effective way to view and understand time series data. They help us to "read" the story that the data tell about how a variable changes over a time period. Such data stories often raise more questions than they answer, but they help us to see the data more clearly than numerical summary techniques.<sup>1</sup>

Scatterplot matrices correspond directly to the familiar numerical correlation matrices. They show bivariate distributions visually with one scatterplot for each combination of variables. They have the advantage over numerical matrices of showing the presence of curvilinear as well as linear patterns in the data.<sup>2</sup>

The timeplot analyses will address hypotheses 1-7 and 15 as stated in Chapter 3. The scatterplot matrices will provide support for the regression analysis (Refer to the regression tables in Appendix C.) that will "test" hypotheses 8-15. These hypotheses will be further addressed by the residual plot analyses in Chapter 5.

## Time Plot Analysis

### Nursing After the Civil War (1870-1920)

Nursing in the Progressive Era (1890-1920). The Civil War focused on the need for programs to prepare women for the profession of nursing. In 1873 the famous trio of schools evolved, Bellevue Training School in New York City, The Connecticut Training School in New Haven, and The Boston Training School. The rise of professional nursing education in the 1870s coincided with professional development and the entrance of women into medicine, law, architecture, the physical sciences, and an increased commitment to higher education for women. Figure 3. shows the slow but steady development of nursing programs, which skyrocketed in 1900 with 432 diploma programs in operation. Table 2. in Chapter 2. shows the pattern of growth for white nursing programs, and Table 6. show the same pattern of growth for black nursing programs, which began in 1886 with a single program at Spelman College in Atlanta, and grew at a rapid rate to 21 diploma programs in 1900. These tables (2 and 6) and Figure 3., when examined provide support for hypotheses one and three (Refer to p. 84 in Chapter 3.)

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**TABLE 6. Black Nursing Programs**

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Year	Total	Diploma	BSN	ADN
1886	1	1		
1890	1	1		
1900	21	21		
1910	30	30		
1920	48	47	1	
1930	55	55		
1940	33	32	1	
1950	30	25	5	
1960	27	17	8	2
1970	22	6	10	6
1977	22	3	14	5
1980	23		17	6
1985	26		20	6

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Source: Original data recalculated from sources presented in Mary Elizabeth Carnegie, The Path We Tread: Blacks in Nursing, 1854-1984 (Philadelphia: J. B. Lippincott, 1986) 31-32.

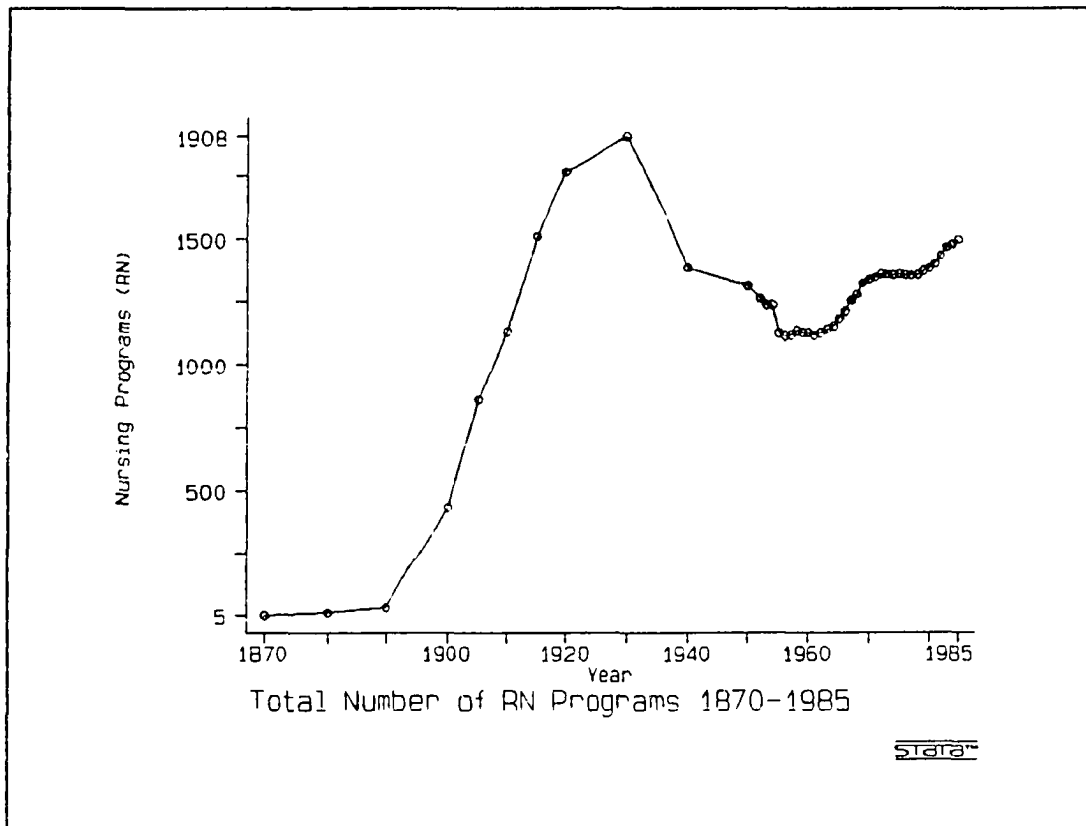


Figure 2. Trends in Registered Nurse Programs 1870-1985

### Women and Education

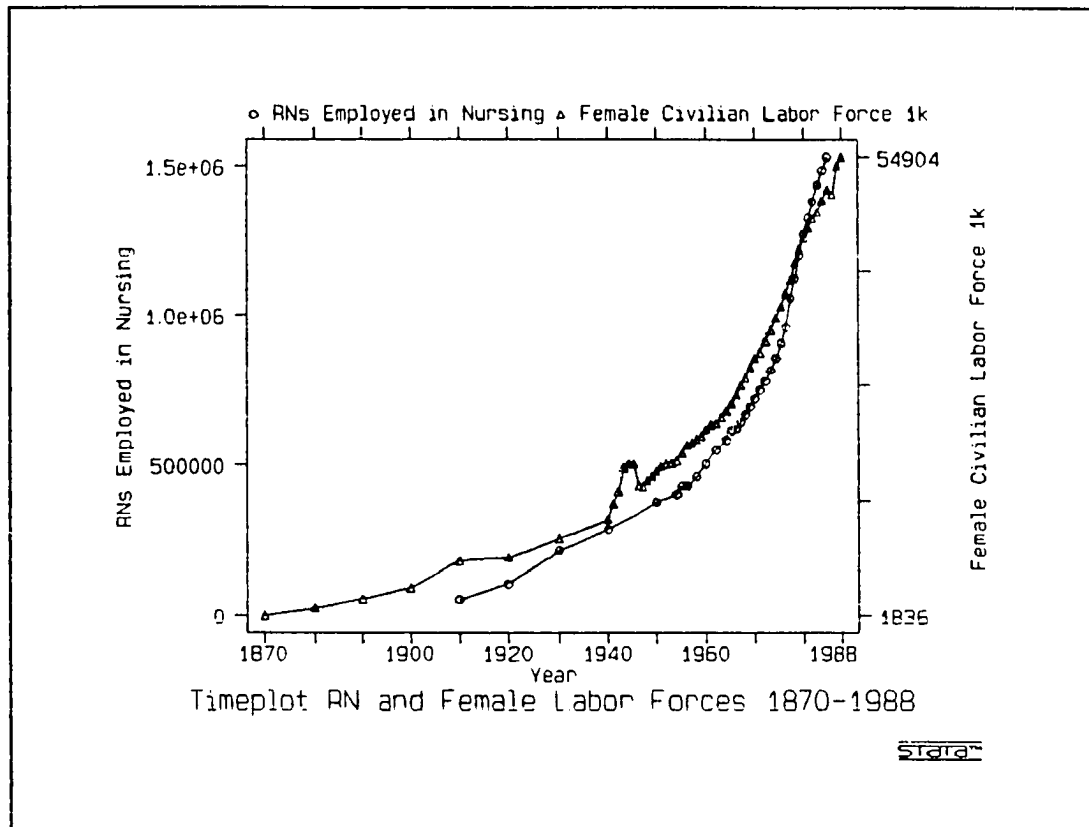
This thirty year period (1870-1900) was characterized by a concerted effort to educate young women, providing them with the opportunity to attend college and pursue a career. Vassar, Wellesley and Smith, founded in the 1860s and 1870s joined ranks with the pioneer woman's college, Mt. Holyoke, founded in the 1830s. A woman who sought a college education was, however, still thought of as unconventional and strong-minded. She also was likely to be middle or upper class and of old line American parentage. Although women were encouraged



to attend college, their numbers were not encouraging with only 2700 women graduating from college in 1890.

Women, including nurses, were becoming increasingly active in the work force. Women's overall labor force participation showed increase slowly from 1800-1850, then it began to decline in the ante-bellum period. There was a sudden sharp increase in female labor force participation during the Civil War decade, which did not continue immediately after the war. The most dramatic change in women's labor force participation came in the period from 1870 through 1930 when the female labor force almost doubled, climbing at a steep rate until the more steady increase of the late 1930s. (See Figure 3.)

From 1870 to 1910 the percentage of female workers in the labor force increased steadily, from 14.7 in 1870, 16.0 in 1880, 19.0 in 1890, 20.6 in 1900, and 25.5 in 1910. (The percentage of women gainfully employed [women were counted as being gainfully employed in an occupation when greater than five thousand women could be enumerated] in nonagricultural occupations were: 1870, 14.0; 1880, 14.5; 1890, 16.5; 1900, 17.7; 1910, 20.6.) The gain in female employment during this period increased from about one worker in seven to one worker in four. In 1920, however, as Hill points out, the percentage declined to 24.0. There is good reason to doubt that this decrease in percentage represents an actual decline in the percentage of women workers during the 1910-1920 decade.



**Figure 3. Female and Nurse Labor Force Participation 1870-1988**

Factors likely to explain this sudden unexpected downturn are associated with the timing and construction of the U. S. Census calculation and reporting system. While these factors were unlikely to effect the count of professional or clerical workers, the large number of agricultural workers enumerated is likely to have been effected. As Hill further explains, the 1910 census date of 15 April was changed to 1 January for the 1920 census, and this could have had considerable effect upon the number of women workers enumerated, particularly in those engaged in seasonal occupations, such as agriculture. The definitions for enumerators were also altered between the

1900, 1910, and 1920 decennial census reports, therefore classification of workers, again particularly agricultural workers, was different for each census enumeration. Consequently, the decline in the reported number of women gainfully employed from 1910 to 1920 may not reflect an actual decline in overall female labor force participation. Nonagricultural female labor force participation was 20.2 in 1920, and increased from one in seven (1870) to one in five (1920) female workers.<sup>3</sup>

Nurses appear to have made the same gains in terms of labor force participation as female workers. The trend for the nursing labor force follows that of all women workers, but with a smoother decade to decade transition, and with the same jump in employment in 1910. Prior to 1920 nursing employment figures are not very reliable. From 1870 to 1900 midwives, trained and untrained nurses, and student nurses, were enumerated under the general designation of domestic and personal services. The category of "Healer", however, did separate out those persons claiming to practice the healing arts who were neither midwives, nurses, physicians nor osteopaths.

With the opening of the first three schools of nursing in 1873 nursing became an organized profession, offering a one year apprenticeship program under the direction of a Nightingale-trained or European trained superintendent. Toward the end of the century, as the number of schools was

increasing rapidly, state licensing bureaus came into existence and counts of state approved schools and their graduates became available. (Refer to Table 1. Chapter 1. p. 14 and Figure 2. p. 84) Not until 1923, however, was machinery in operation in every state for approving schools and admitting graduates to licensure examinations. In 1910 the occupational category of trained nurse, ranking next to teacher in the number of women gainfully employed, was placed in the grouping of professional workers. The 1910 estimate of 50,500 and the 1920 estimate of 103,900 active professional (trained) nurses was separated from the student nurse and midwife category for a more accurate count.<sup>4</sup> (See Figure 3.)

#### **Nursing and the "Cult of True Womanhood"**

Women began to enter the labor force, a masculine sphere, during the period in which the "cult of true womanhood" or "the cult of domesticity" reigned supreme. The "cult of true womanhood" or the "cult of domesticity" was the Jacksonian Reform Era (1820-1860) view of the middle class woman or "true lady", as the epitome of those virtues that were truly feminine.<sup>5</sup>

The "cult of true womanhood" restricted women's entrance into the workforce, and it is, thus, a likely explanatory factor for the trends in women's labor force participation shown in the timeplots. In order to understand the impact of the "cult of true womanhood", it is necessary to examine certain social and social historical aspects of a previous

era. This is important, as it relates to the movement of women out of their traditional sphere, the home, and into the public sphere, the workplace.

The American "true woman" was a variant of the English Victorian "lady", and her image was popularized by such women's magazines as Godey's Lady's Book. In her landmark essay on the "cult of true womanhood" Barbara Welter describes the four cardinal virtues which characterized the role of "true womanhood": piety, purity, submission and domesticity.<sup>6</sup> Of these virtues domesticity or love of the home gave woman her "natural sphere", and she was expected to remain there and be completely fulfilled as a wife, mother, and homemaker. Many women felt that they could not live up to the ideal of the "true woman", but the "cult" was so ingrained and internalized that few did not try to measure up to this ideal. The ultimate expression of the successful "true woman" was the maintenance of a serene home. Within this home the woman's major responsibility was child care and child rearing. The goal of the "true woman" was to provide total physical and emotional care for her children and her husband, thus exemplifying the nursing/nurturing role within the home.

White women did engage in work in the economy or the public sphere. In addition to plantation management, farming, domestic service, and factory work, women, during the height of the Industrial Revolution in America, entered the professions. Middle-class white women were both primary and

secondary school teachers, physicians, midwives, and nurses. In the late 18th and early 19th century, when medicine became professionalized, its doors were closed to women. Women, however, continued to practice the "healing arts", playing an active role in the Popular Health Movement of the 1830s and 1840s which rivalled organized medicine throughout most of the 19th century. Women practitioners promoted gentle treatment and placed emphasis on preventive care, giving less harmful remedies to the sick than the more drastic methods of regular doctors. One of the major contributions of woman healers of this period was the education of women about their bodies and the importance of such routine health measures as diet, bathing, rest, exercise and sanitation.<sup>7</sup>

Harriet Hunt, an English trained physician, and Elizabeth Blackwell, the first woman to gain admission to a regular American medical school, were noted women physicians of this era, who practiced preventive medicine, achieving success and gaining recognition outside of traditional male medical circles. Nurses and particularly midwives were active during this period, but little specific information is recorded about their activities, until the ante-bellum period (1861-1865), the Civil War years, and the emergence of nursing as a formalized system of work in 1873, the latter part of the Reform Age.<sup>8</sup>

While white middle-class women were occupied in the domestic sphere, with limited participation in the

professions, lower-class white and immigrant women were often employed outside the home in factories and in domestic service. Few were directly involved in recorded nursing care outside of their immediate families. Black women of this period were tied to the plantation, working either as house servants or fieldhands. It is assumed that they provided basic nursing care to plantation families, but no records exist of the care given by black maids in the home.

By 1840 all of American society had changed; industrialization had created a new egalitarian ideology. Privilege was now based on ability rather than inherited status. Women, however, were directly excluded from this new democracy and even lost some of the freedoms that they once held in colonial society. Although women did benefit indirectly from industrialization through their husband's increase in wealth and social position, their role as a producer in the economy was curtailed. Women's work outside of the home was no longer socially acceptable, and those who entered the world of work were most often poor women taking low paying unskilled factory jobs. American industrialization, occurring in an underdeveloped economy with a shortage of ready labor, welcomed female labor participation. One important but negative result of the social and economic benefits of industrialization for poor women was the sharpening of class distinctions between women, distinctions

related to but set apart from those stemming from women's spousal class identification.<sup>9</sup>

The "cult of true womanhood" in the North and the South not only doubly disadvantaged and victimized poor women and Black women by further separating them from their "gender sisters" it glorified the "society lady" by making her almost singular function one of conspicuously displaying her husband's wealth and social position by her manner of bearing and dress.<sup>10</sup> This public display of wealth and position also reinforced traditional class distinctions and preserved the labor and social systems based on racial divisions.

#### Woman's Work and the Reform Movement

While women of this age were divided from one another by race, public/private sphere labor, social and economic class distinctions, they were united in one important respect--disenfranchisement. All women of this period, whether educated and propertied or economically and socially disadvantaged, were denied the right of suffrage and isolated from political power. The male oriented and male dominated reform movements of the period raised their hopes and expectations. These hopes and expectations took many forms. In the South the "female" reform movement took hold within the abolition movement with the 1836 publication of Sarah and Angelina Grimke's "An Appeal to the Christian Women of the South" (written by Angelina) to speak out against slavery. Two years later they linked together the two issues which occupied their minds and work,



slavery and the position of women, with the publication of the 1839 pamphlet, The Equality of the Sexes and the Condition of Women (based on Sarah's letters which were published in The Liberator and The Spectator).<sup>11</sup> In the North the Lowell (Massachusetts) mill women and other working women of Massachusetts were banding together to seek labor reform. This pattern was repeated in New Hampshire, New York, Rhode Island and Pennsylvania, as well.

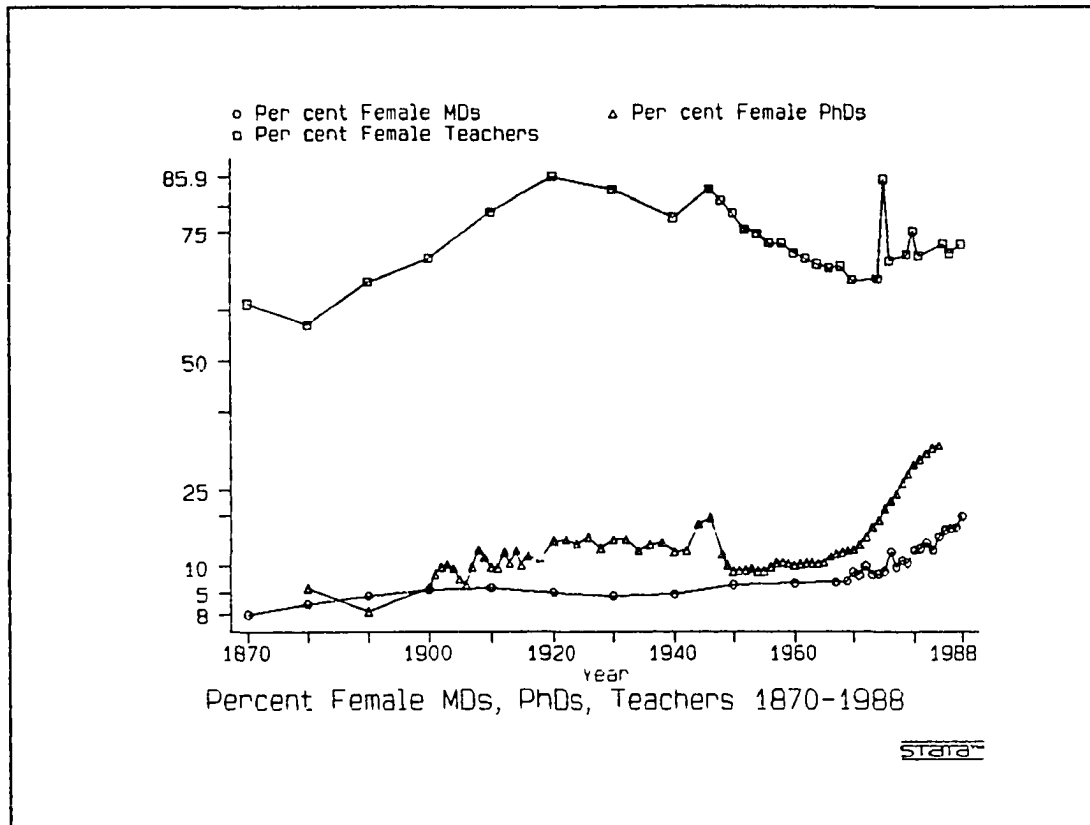
The women's labor reform and the anti-slavery movements gained support and strength from the emergence of woman as a thinking being. The push for higher education for women was moving forward, grounded in the efforts of such pioneers as Emma Willard and Hannah Mather Crocker. These two advocates of women's education firmly rejected the creed that "woman must forever occupy an inferior position because of her inherent frailties".<sup>12</sup> Woman's rights, including marital and property rights, and protection under the law, could no longer be silenced. The culmination of all of these efforts to move women out of unsatisfactory positions was the Seneca Falls Convention of 1848.

Those women who resisted "the cult of true womanhood" and were able to move beyond the "private sphere" of the home did engage in work in the economy or "public sphere". This period was characterized by industrialization, the rise of wage labor, rationality, and the development of technology successfully separated the home and isolated the family unit

from the economy. The labor force participation rate for women workers, which showed a slow steady increase across this time period, was in no way a rejection of womanhood. (Refer to Figure 3. p. 84) As Rosenberg and Cogan point out, what was rejected by many middle and upper class women was "the cult of true womanhood" in favor of the coexisting "ideal of real womanhood".<sup>13</sup> "The ideal of real womanhood" was a literary construction which regarded women's intellectual abilities and capabilities as the reigning vision. Unfortunately, these women, when they entered the labor force, did not move into the work of male competition. Rather, they entered women's professions, nursing, teaching, social work, and librarianship. (See Figure 4.) In this way they continued to be subordinated to the needs of society. Lower class women fared much worse. They also entered sex-typed occupations, but occupations with little prestige. They were also subordinated to the needs of society and to the economic needs of their families. As Matthaei notes in her discussion of sex-typed labor, these women were at the mercy of industrial capitalism. They did not enter the labor force, merging into a sexless mass of workers, but were restricted in an equally degrading way by being cast into women's jobs.<sup>14</sup>

#### Women in the Professions

Women did begin to make inroads into the "restricted professions" after the Civil War. They also began to follow the "cult of ideal womanhood" which led them to seek



**Figure 4. Female Professional Workers 1870-1988**

opportunities in higher education. The number of women receiving baccalaureate or first professional degrees increased from 1378 in 1870 to 16,642 in 1920, while the number of master's or second professional degrees increased from 210 in 1895 to 1294 in 1920. The percentage of women receiving doctoral degrees increased from 5.9 (3) in 1880 to 15.1 (1294) in 1920 with a noticeable drop to 1.3 (2) in 1890, largely accounted for by an increased number of male PhDs during that decade. Female physicians increased in number during this time period, as well, with .8 percent of all physicians being female in 1870 to 5.0 percent in 1920 (a

slight decrease is noted from the modest but steady increase from 2.8 in 1880 to 4.4 in 1890, with 5.6 percent female MDs in 1900 and 6.0 percent in 1910). As the percent of female teachers, physicians and PhDs began to increase into the decade of 1920, more professional wage earners were participating in the labor force. (See Figure 4.)

The profession of teaching has traditionally been the leading occupation for women in the United States. In 1870 the percentage of female teachers was 61.2, and in 1920 85.9 percent of all teachers were female (these percentages exclude college professors). This profession outpaced nursing as the leading profession for women during the progressive era, although females constituted a far larger percentage of nurses than teachers during the years 1870-1920: 95.8 percent in 1870; 95.3 percent in 1880; to a low of 91.7 percent in 1890; 93.7 percent in 1900; 92.9 percent in 1910 and 96.3 percent in 1920.<sup>15</sup>

Trained nurses in the progressive era were generally unmarried (93 percent) and between the ages of 19 and 44 years (85 percent). Less than two percent of all trained nurse were of immigrant parentage and fewer than one percent were black. In 1920 51.3 percent of all trained nurses lived with their employer, while 18.9 percent boarded or lodged outside of the family domicile.

The number of nursing schools<sup>16</sup> and nurses expanded rapidly in the early 20th century. (See Figures 5 and 6) The

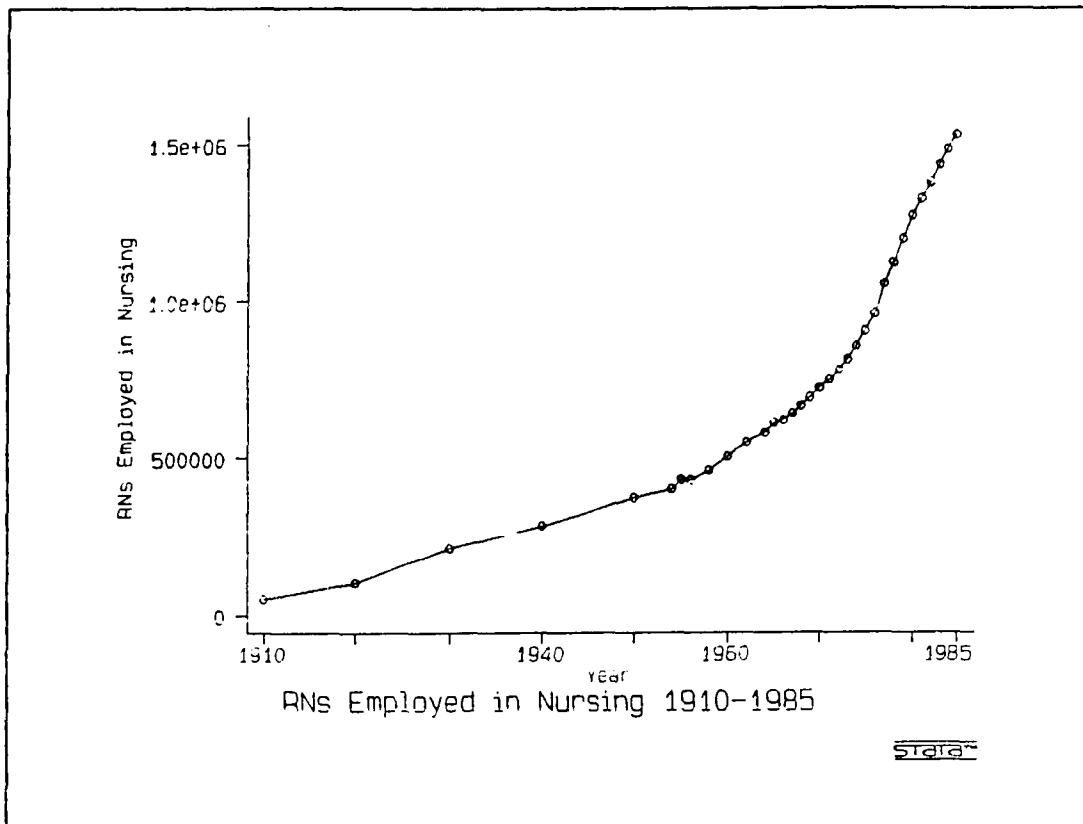
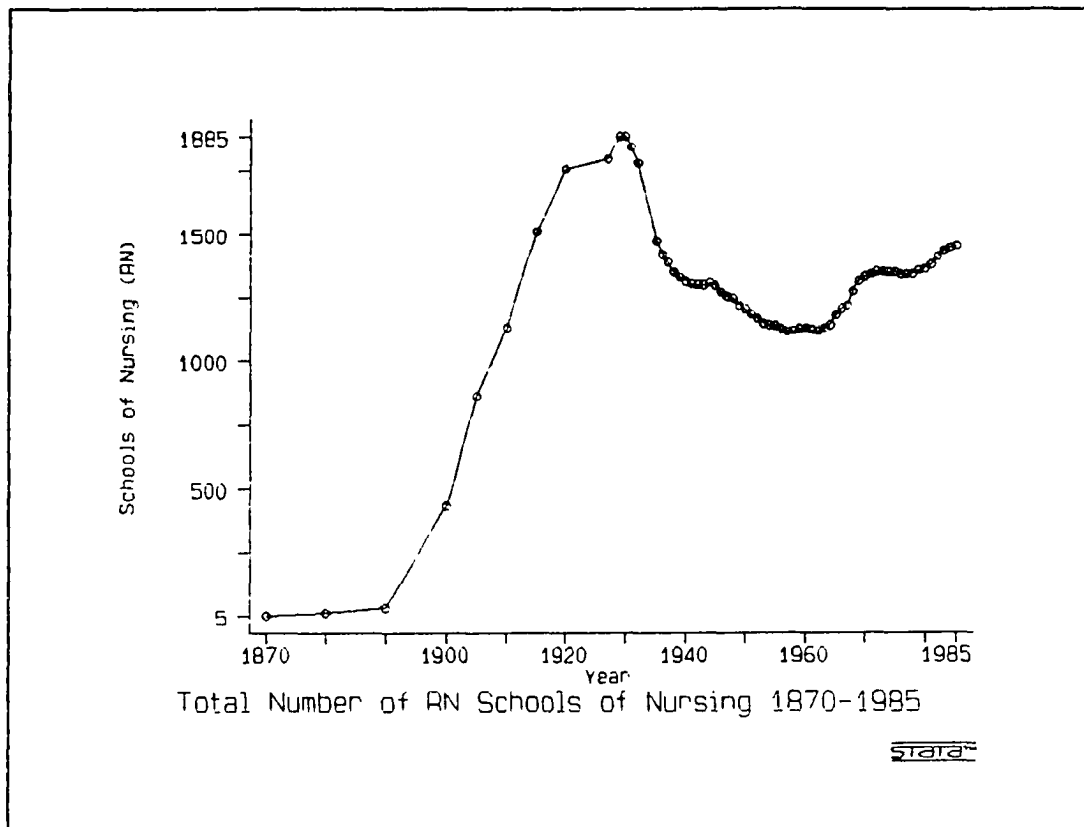


Figure 5. Trends in Nursing Employment 1910-1985

nursing registration laws, enacted in many states at the beginning of the century, gave nursing the right to set standards of nursing education and restrict practice, but did not outlaw untrained nurses from practicing or set controls on the number of schools of nursing. Nursing, following an apprenticeship model, made nurses, whether trained, in-training or untrained, a source of cheap labor. Most trained nurses left the hospital upon graduation and went to work in public health, as a "visiting" nurse or worker in other types of "home-based" nursing positions. In 1920 only one-tenth of all registered nurses (11,00 out of 104,000) worked in the

hospital. The major suppliers of hospital labor were the student nurses (60,000), and untrained nursing personnel.



**Figure 6. Trends in Schools of Nursing 1870-1985**

The Goldmark Report (1923) identified problems inherent in staffing hospitals with student nurses and untrained nurses, citing their lack of knowledge of disease conditions or treatment procedures. At this time the use of students and untrained nursing personnel was widespread. The apprenticeship system afforded hospitals a high profit margin. (Refer to the discussion in Chapter 2. for an explanation of hospital profit-making and exploitation of students.) Students and untrained nurses earned an average of \$40.00 per month plus

room and board, while hospitals exploited their labor by extending and expanding their roles to include housekeeping and custodial duties. The movement was underway, however, to abolish the apprenticeship system and to change the woefully inadequate pay structure for nurses both within the hospital and in home-based care. Changes were forthcoming, but not quickly enough nor with the focus on nursing as women's work.

Nursing in this "progressive era" was seen as a second-class profession, and "with second-class professionalism came second class feminism".<sup>17</sup> Nurses were often the instrument of their own subordination by accepting and identifying with the hospital system of training and employment. During the period of the woman's suffrage movement, from its emergence after Seneca Falls to the official adoption of the Nineteenth Amendment in 1920, nurses were by and large anti-feminist. To the detriment of their own growth, as a profession, and with rare exception, nurses were bitterly conservative supporters of patriarchal social arrangements.

#### Nursing from 1920 to the Eve of World War II

The Development of the Nursing Profession. The 1923 Goldmark Report attempted to not only stop the abuses of the apprenticeship system, its ultimate goal was to regulate the supply of nurses. After World War I there was an abundant supply of cheap nursing labor. Additionally, there were more

hospitals in the United States than exist today. Many were quite small and needed low cost nursing care in order to survive. They also needed the revenues which a school of nursing generated.

The Goldmark Report addressed the problem of nursing labor supply by clearly articulating that the training of nurses could only be accomplished through professional education. The Report further developed a hierarchical system of nursing labor, identifying the categories of nursing aides or attendants as the lowest level of nursing personnel. This group, previously termed "practical nurses" (practical nurses returned as an enumerated category within nursing in 1954 with the initiation of standardized accredited LPN programs in most of the states), was to be clearly differentiated from the registered or professional nurse, whose training program would be standardized and regularized through licensure. Goldmark envisioned the highest level of professional nursing as being trained in a university school of nursing, the "keystone" of her elite system of stratification.

Goldmark's proposal and Burgess' Committee on the Grading of Nursing Schools reports were generally not challenged by hospitals and physicians, because they left the control of the nursing labor supply in the hands of hospital administrators, catering to the needs of doctors and hospital boards. While protecting nurses by calling for an end to the apprenticeship system and clarifying the legal status of the registered

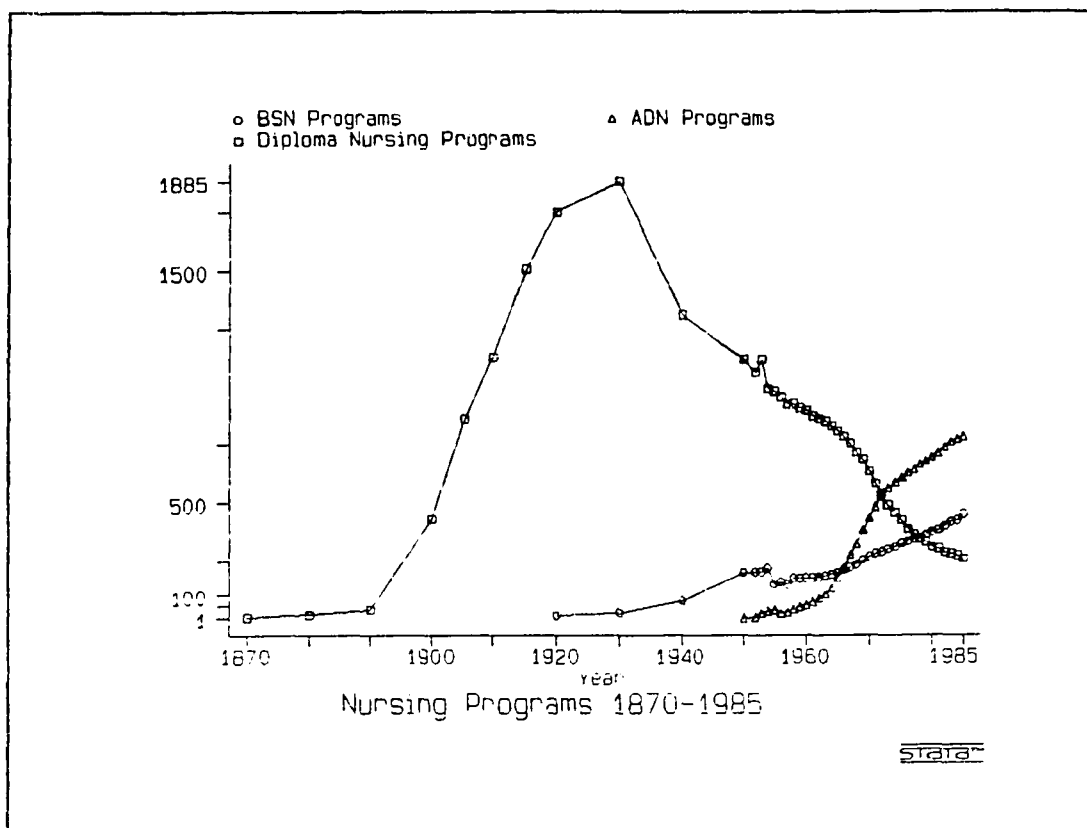


nurse, these reports were most significant in their creation and support of a stratified occupational hierarchy..

#### The Great Depression Era and Nursing

The major changes in nursing practice and nursing education, which came about as a result of nursing actions in the late 1920s, were solidified by the economic conditions taking hold in the United States prior to World War II. The Great Depression had a strong influence on nursing, as the movement to replace student nurses in the hospital labor force with graduate nurses was in progress. The situation for nurses, as well as for all female and male workers, became dismal when the depression hit at the end of 1929. The percentage of women in the labor force in 1930 was 26.3 with 21.9 percent of all workers being female, an increase of roughly 4 percent above the 1890 percentage of 17.0.

In 1928 the situation for graduate nurses in home-based and hospital employment was already quite bad, as the rapid expansion of nursing programs after World War I had produced an abundance of nurses. There were 1885 schools of nursing with 1908 nursing programs (55 of which were black nursing programs) in operation in 1930. With 214,300 nurses in the labor force these schools, which included the first 23 baccalaureate programs, graduated an additional 21,763 nurses in 1930. (Refer to Figure 2. p. 82 and Figure 5. p. 95 and See Figures 8. and 9.)



**Figure 7. Trends in the Establishment of Diploma, ADN and BSN Nursing Programs 1870-1985**

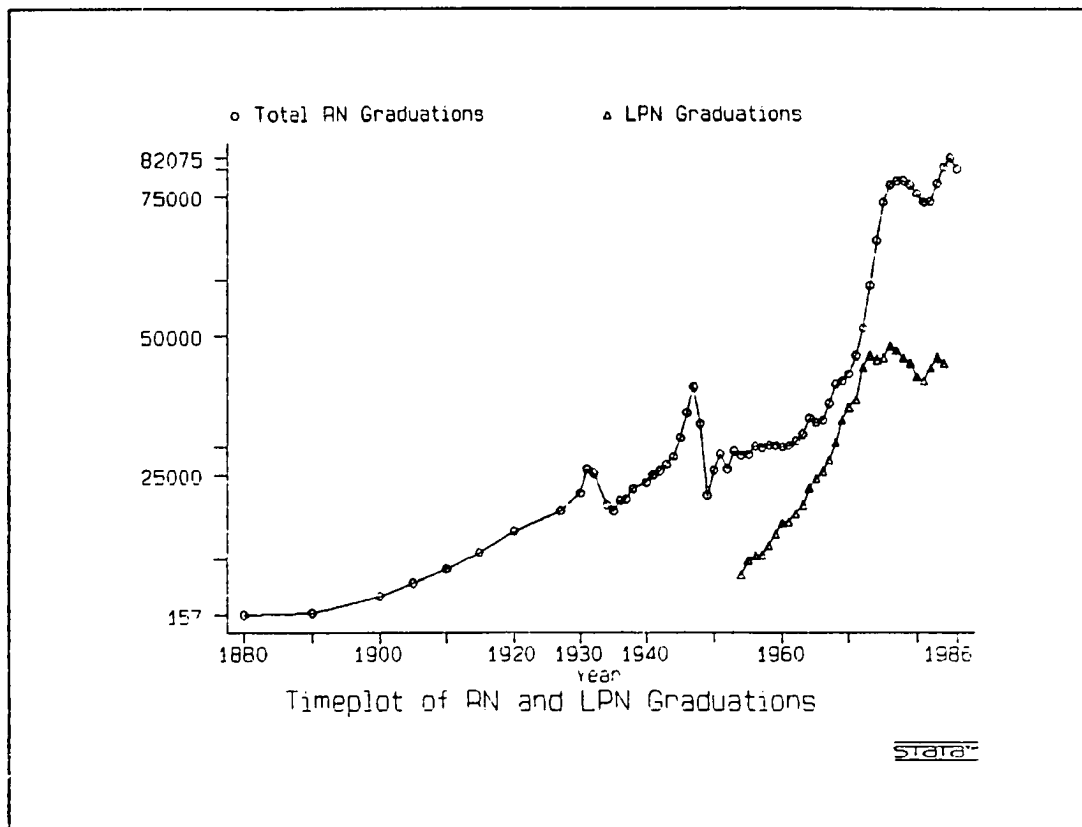


Figure 8. Trends in RN and LPN Graduations

General unemployment and a decrease in health care spending caused a contraction of nursing services, especially for private duty care. During this period, the elimination of many student nurses from hospital work and their replacement with graduate nurses (from 4,000 in 1929-30 to 28,000 in 1940), combined with the acceptance and promotion of the 8 hour day for nurses by the American Nurses Association (ANA), helped to relieve RN unemployment.

The initiation of the 8 hour day, while humanitarian and beneficial to working nurses, was proposed primarily to

relieve unemployment and not to foster improved working conditions. The improvement in working conditions, which persisted, was a happy byproduct of a measure designed to move graduate nurses toward full employment in tough economic times.

During the Depression years the number of nursing schools continued to decline from 1885 in 1929 and 1930 to 1311 in 1940. With this decline in schools of nursing, nursing programs saw a decline as well from 1908 in 1930 to 1387 in 1940. (See Table 1. p. 14 and Figure 2. p. 82) However, the system of nursing education began to change as well. As the number of schools of nursing decreased, all of the programs closing were diploma nursing programs. Baccalaureate programs in nursing actually increased in number from 23 in 1930 to 76 in 1940, as shown in Figure 7. Graduations from schools of nursing increased slightly to 24,899 in 1940 with the largest gains made in baccalaureate programs.

With the onset of the Depression the pattern of nursing employment changed also. Graduate or registered nurses had become the primary labor force in hospitals. The advent of health insurance, 9.3 percent of the population now had some form of private health insurance (1940), the centralization and consolidation of health services, and the closing of many small proprietary hospitals, all led to the preeminence and predominance of the hospital in health care and as the site of choice for nursing labor.

These changes reinforced the stratification of nursing and cemented levels of the nursing hierarchy. A clear-cut division became evident between the hospital RN, the private duty RN, and the private duty PN or "practical nurse". At the same time the category of auxiliary health care workers (which still included "practical nurses" for enumeration), nursing aides or attendants and orderlies, expanded rapidly. Most auxiliary nursing personnel were hospital based with others gaining a foothold in the newly developed nursing care homes. The integration of lower cost nursing personnel was to have a profound effect on the nursing hierarchy in its quest for professionalism and the health care system in its quest for high quality nursing care at a bargain basement price.

The organization of the nursing hierarchy and the stratification of nursing ranks took shape in the 1940s, a time in which a much touted hospital nursing shortage appeared. This shortage, apparently caused by hospital expansion and competition, was fueled by the jump in median salary levels for professional nurses from \$178 in 1946 to \$213 per month in 1950 with smaller hospitals trying "to hold the line" on costs. The hospital was now clearly the major employer of nurses, and nursing had become institutionalized by the application of standards through the homogenization of nursing education, the accreditation of nursing programs and the licensure of nurses. These measures were meant to insure the American health care consumer of quality in nursing care,

while increased health care expenditures in the form of public monies and private health insurance insured quantity. Total health care expenditures per capita increased from 29.5 million dollars in 1929 to 70.9 in 1948 or from 3.5 to 4.1 percent of the Gross National Product (GNP).

### **Stratification of Nursing**

Nursing was now separated into four divisions or classes of workers: baccalaureate RNs, diploma RNs, LPNs, and auxiliary health care workers (aides, attendants and orderlies). An additional grouping or category of ancillary health care workers, including occupational therapists, laboratory technicians, and even social workers and psychologists, was also defined. Professional nurses still remained identified as all registered nurses regardless of educational preparation.

This division of labor in nursing persists today in the 1980s, perhaps differentiating levels of nurses even more than it did when first constructed. It should be noted that this hierarchical system in nursing parallels the sexual stratification and sexual division of labor within the health care system itself. This sexual division of labor, grounded in paternalism and a patriarchal medical care model, places nurses not only below physicians and ancillary health care workers, but relegates them to less than second class status beyond that of such ancillary health care workers as

psychologist, physical and recreational therapists, and laboratory and X-ray technicians.

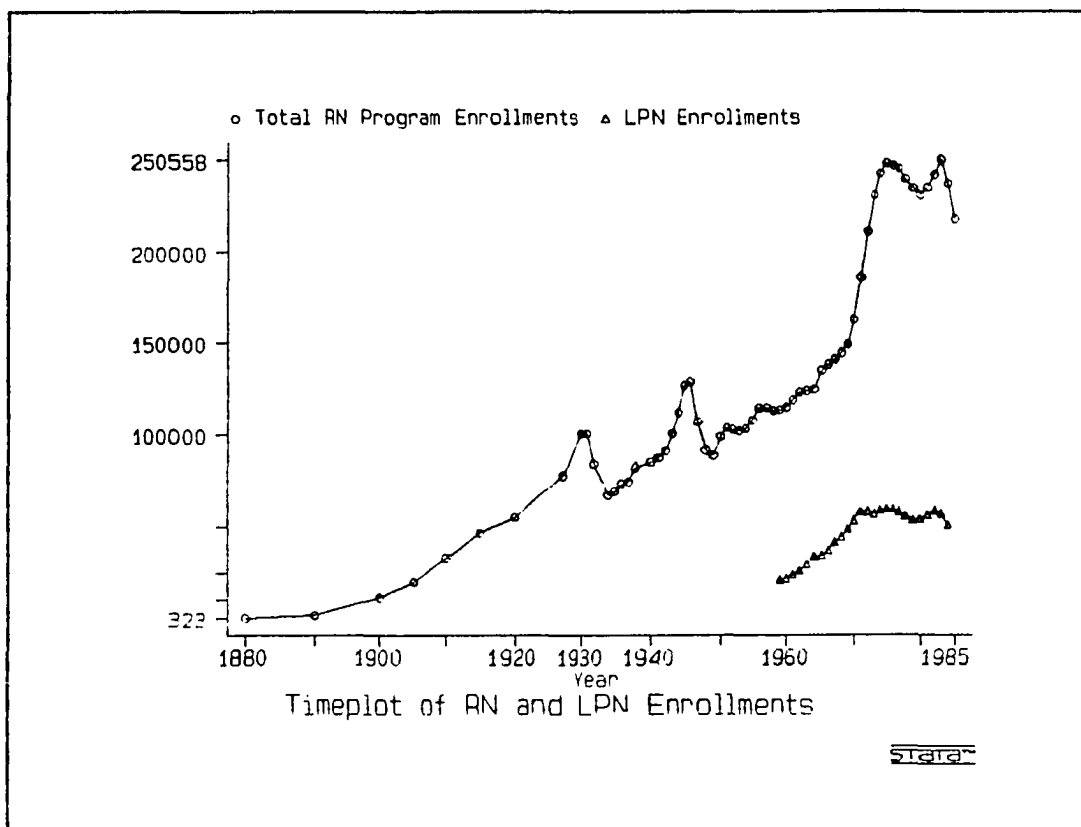


Figure 9. Trends in RN and LPN Enrollments

#### Nursing and World War II

Nursing, during the pre war and war years, saw unprecedented growth in both professional and student nurse groups. Enrollment in educational programs was also soaring 9.5 percent of all female high school graduates entered nursing between 1943 and 1945. Only black nurses, for whom the number of opportunities to enter nursing programs were diminished (black nursing programs decreased from 55 in 1930 to 33 in 1940) were exempt. There were 7,000 student and

professional black nurses in 1940 and 13,000 black midwives and practical nurses. The number of white professional nurses in the labor force grew 11 percent between 1940 and 1944 to reach 132,885 and the number of white students enrolled in nursing programs grew 32 percent to a level of 112,249. Beginning in 1947, however, there was a steep decline in the number of enrollments in nursing programs from 128,828 in 1946 to 106,900 in 1948. The steepest decline was in diploma programs with a drop from 121,654 in 1946 to 82,182 in 1949. Baccalaureate enrollments remained steady dropping slightly from 7,174 in 1946 to 5,475 in 1947. (See Figures 10. and 11. and Refer to Figure 3. p. 84)

In spite of the great wartime need for physicians, the overall increase was 3.5 percent. The percentage of female physicians increased from 4.6 in 1940 to 6.5 in 1949.

During the World War II period the demand for all female workers grew, and women entered the workforce in increasing numbers. There were important changes in the pattern of women's employment during this period, most spectacularly the movement from agricultural to factory work, as a result of the burgeoning war industry. As the wartime demand increased for workers in female dominated professions, such as nursing and teaching grew, so too did employment demand increase in nontraditional areas. "Rosie the Riveter" became a commonplace figure on the American landscape. War needs brought an ever-increasing number of older women, married women, and women



with children into the workforce. The median age for working women increased from 32 to 36.5 from 1940 to 1950. While the 25 to 44 year age group accounted for almost half of all working women across the decade, in 1950 the proportion of women 45 and over was notably larger (30 percent in 1950 as opposed to 22 percent in 1940). In 1940 15 percent of married women were in the labor force, whereas in 1950 23 percent of the labor force was made up of married women.

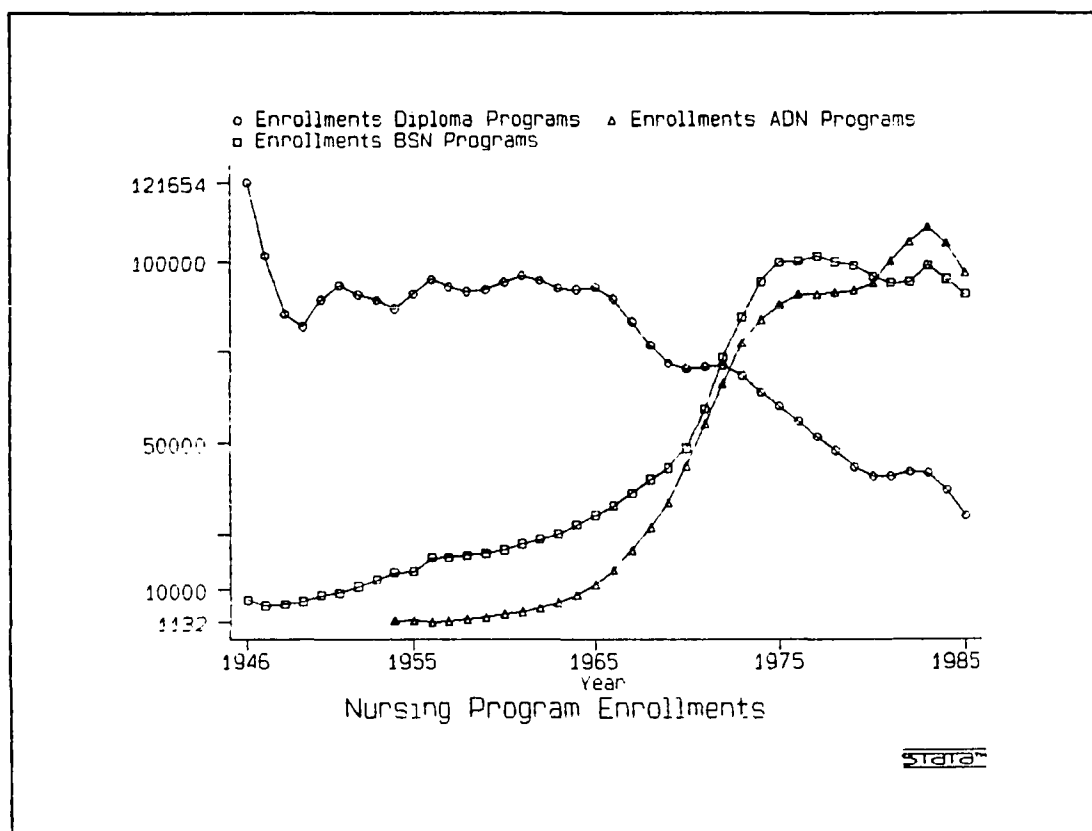


Figure 10. Trends in Nursing Program Enrollments

In the World War II period many older nurses returned to nursing, some after many years of inactivity. The older nurse became a respected member of the nursing profession and was

accepted as a full member of the health care team. By 1951 20 percent of all nurses were 40-49 years of age and 11 percent were over 50. With the advent of the war more married nurses and nurses with children entered both part-time and full time employment. This was the beginning of a trend in nursing toward becoming a "more married profession", and in 1951 46.4 percent of all active nurses were estimated to be married. (Refer to hypothesis six in Chapter 3. p. 73)

### **The "Defeminization of Labor"**

The emergencies of the war swept away many traditions in employment, and, as more women entered the workforce, women's social and economic condition changed. In this period of expanding labor need and participation, the U. S. economy turned to its women. In 1940 there were 13 million women workers, about the same size as the entire workforce in 1870. Several factors contributed to the great increase in female labor force participation in the 1940s. One of the most obvious factors was the tripling of the female population of 1870. Another factor was likely to have been the aging of the female population. This led to a larger proportion of the female population being of working age. Finally, increased labor force participation in the 1940s resulted from the entrance into the labor force of women from varied age, racial, ethnic, social and economic groups.

These women entered a variety of occupations and professions, but those characterized as female dominated or

women's occupations and professions gained the largest number of workers across the decade. In 1940 over three-quarters of all women in the workforce were either teachers (52.1 percent) or nurses (23.8 percent), and 75 percent of all teachers and 98 percent of all nurses were women. By the end of the war two-thirds of all professional women were nurses or teachers. In 1950 43 percent of all female workers were teachers (74 percent female) and 24 percent of all women in the workforce were nurses (98 percent female). Women's work in the public sphere immediately after World War II was much more heavily concentrated in specific occupations, which were likely to be female dominated and identified as women's work. This is a clear indication that the development of the female labor force in general and specifically the nursing labor force did not lead to a "defeminization" of labor or nursing labor in America.

Nursing in the Post World War II Period. Unlike many women workers in the general labor force, after the war nurses did not retreat back into the private or domestic sphere, nor were they normatively restricted to that sphere or forcibly excluded from active labor force participation by male workers. Of the 58 million women of working age in the first half of the 1950s 19 million or about one third were in the labor force. Occupational choices were opening up to women and educational opportunities were unbarred. Women were now

uniformly accepted at institutions of higher learning and practically all professional schools were open to women. However, while the number of female high school graduates increased from 629,000 in 1950 to 849,000 in 1959 and the number of female baccalaureate graduates increased from 103,000 in 1950 to 127,000 in 1959, the percent of female PhDs declined from 19.6 in 1946 to 9.1 in 1950 and did not recover until 1958 with an increase to 10.8. By far the greatest number of first professional degrees for women were in education (38,352). In nursing 4,091 women and 46 men received degrees, as recorded in the 1951-52 list of earned baccalaureate degrees.

During this decade the number of female teachers increased from 914,000 in 1950 to 1,387,000 in 1960 with the percent of females engaged in teaching dropping from 78.7 to 71.0 percent from 1950 to 1960. Teachers and nurses still tended to dominate the female labor force, ranking first and second as professional employment. Female physicians showed little proportional growth, increasing from 5.5 to 6.8 percent from the beginning to the end of the decade. (Refer to Figure 4. p. 93)

Wages and "equal pay" are a major concern among all female workers. Widespread and sustained interest in equalizing women's salaries was evident in proposed state legislation. While women continued to lag behind men, earning about 60 percent of men's wages, salaries for professional

women, including teachers and nurses, followed a similar upward trend as shown in Figure 12., which support hypotheses two and fifteen. (Refer to Chapter 3.)

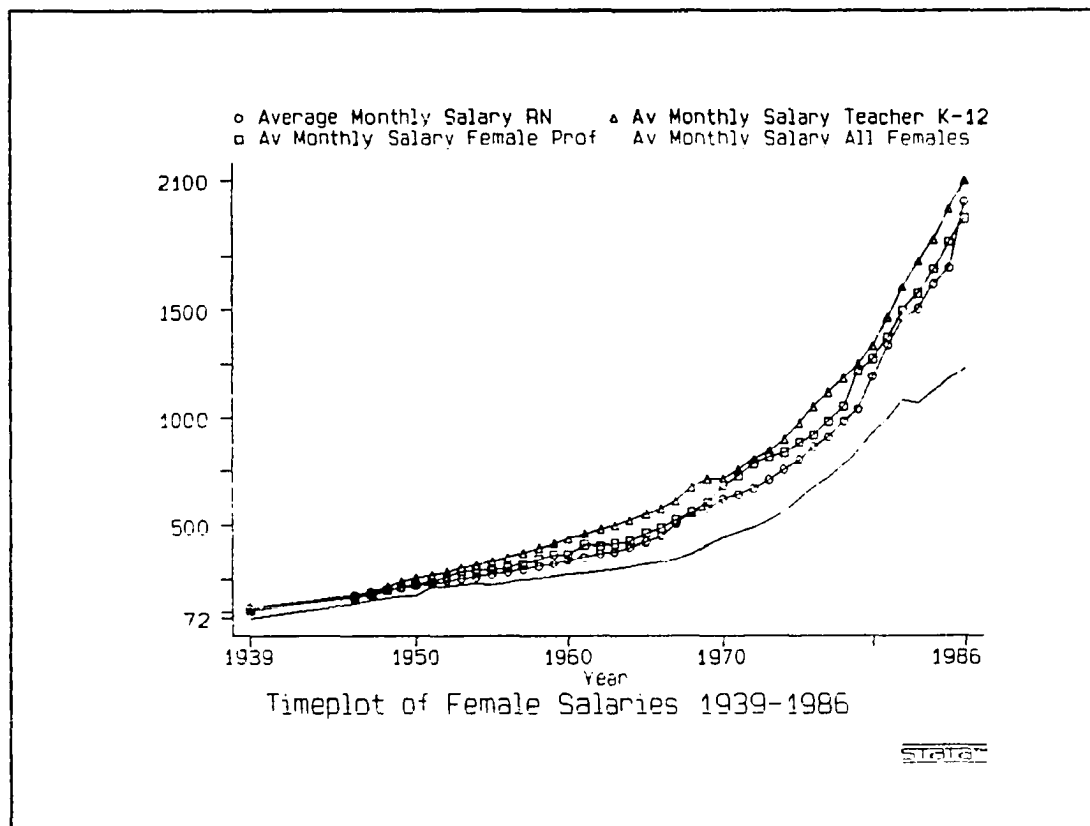


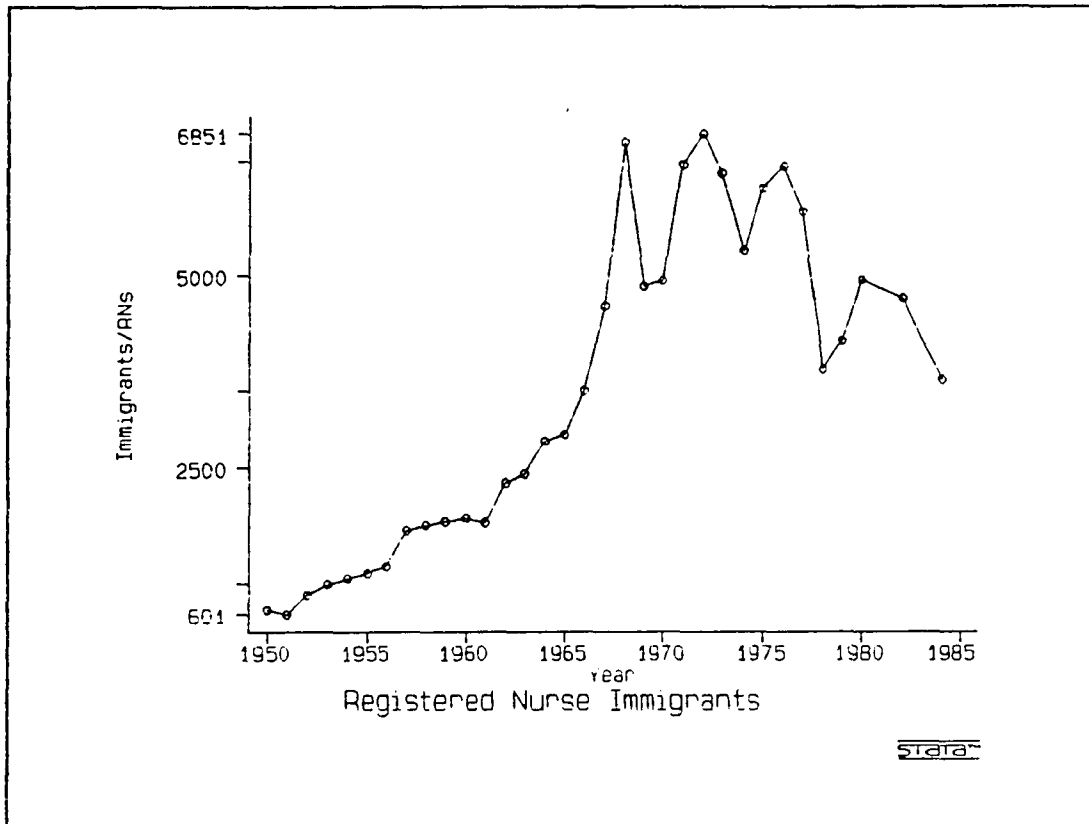
Figure 11. Trends in Female Salaries 1939-1986

### Integration in Nursing

Gains for black women were evident in this period. Black women made up 10 percent of the female population and 12 percent of the female labor force. They represented the largest proportion of women workers in all nonprofessional groups except farm workers. The percentage of black women in the labor force had increased 20 percent from 1940 to 1950.

In 1950 6 percent of black women were in professional occupations, teachers representing the single largest group. Black nurses, while still a small proportion of all nurses, estimated at 3 percent in 1951, now had greater opportunities for training in nursing.<sup>18</sup> In 1950 the number of "white" schools admitting black nursing students quadrupled from 76 in 1946 to 273 in 1952. Black nursing programs overall declined from 33 in 1940 to 30 in 1950 and 27 in 1960 with an increase in baccalaureate programs from one in 1940 to 8 in 1960. During this period nursing began to deal with its own discrimination, particularly in access to education with baccalaureate and ADN programs leading the way.

The annual flow of foreign trained, or immigrant nurses, was quite small before 1960 (fewer than 2000 per year). The number grew rapidly to a high of 6735 in 1968. A "peaks and valley" pattern is seen for the following ten year period with highs occurring in 1972 (6851) and 1977 (5825). The numbers dropped after 1982 and have continued to decline for the remainder of the decade. (See Figure 12.) This influx, while expanding the nursing workforce, does not appear to have an appreciable effect when examined against the great gains in nursing labor force participation by native Americans during this same period. (Refer to Figure 17. p. 120) These factors do not support hypothesis four, which stated that increased nurse immigration would increase nurse labor force participation.



**Figure 12. Trends in Admission of RN Immigrants**

Additionally, the largest gains in female labor force participation by immigrant women, largely Asian, during this period, were reflected in occupations other than nursing. The immigrant nurse group was formed of generally non-Asian workers. Nurses tended to emigrate to the U. S. from northern Europe and the American territories. The nurses from American territories were considered "foreign", because they were trained in non-American nursing programs and could not immediately meet licensure requirements.

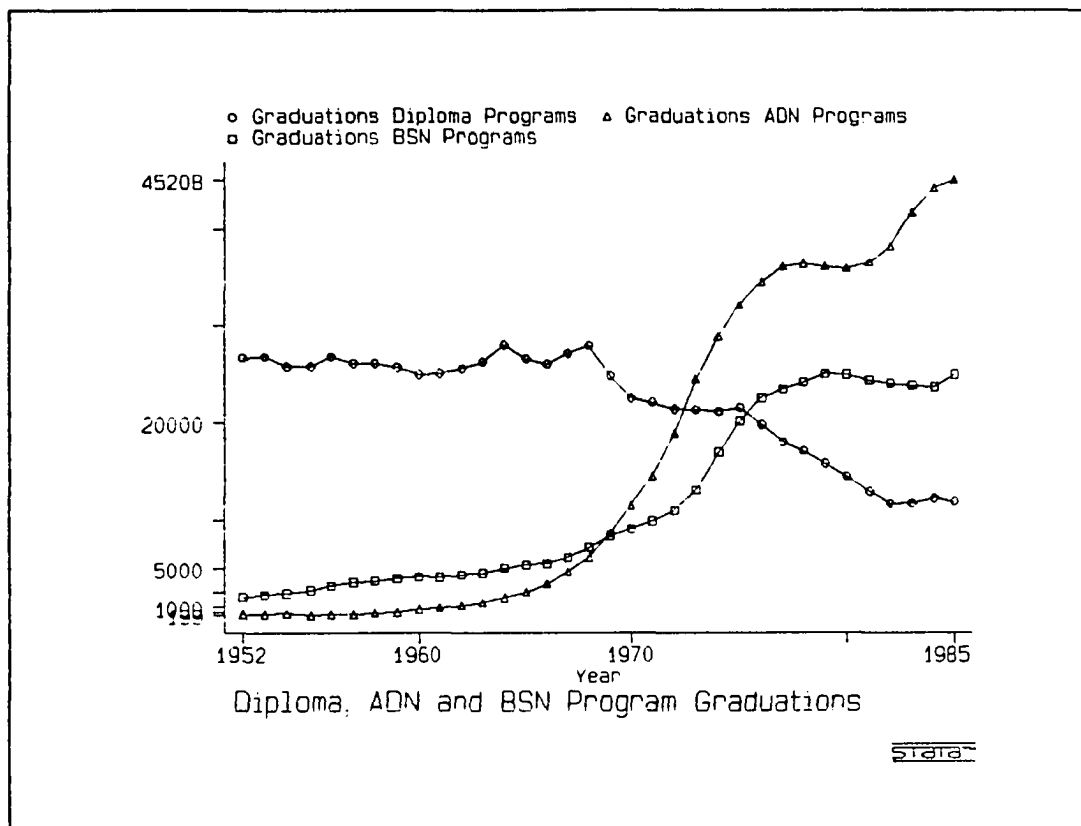


Figure 13. Trends in RN Program Graduations

With some integration under way and the restructuring of nursing organizations nearly complete, reducing the leading bodies of nursing to the ANA and NLN, the 1950 report on Nursing at Mid Century continued the work of the 1930s Grading Committees by surveying nursing schools to determine an appropriate classification system. The report also served as the impetus to raise standards of nursing education, encouraging borderline schools to close. At this point we begin to see the start of a massive decline in diploma programs and diploma nurses eligible to enter the field of



nursing. (See Figure 13 and Refer to Figure 7. p. 100) With the decline of the diploma program we begin to see a further stratification of nursing in the standardization of LPN programs (with LPNs being enumerated separately from other auxiliary health care workers, giving more accurate counts of practical nurses) and the creation of ADN programs at mid century. (See Figures 13 and 14 and Refer to Figure 8. p. 101)

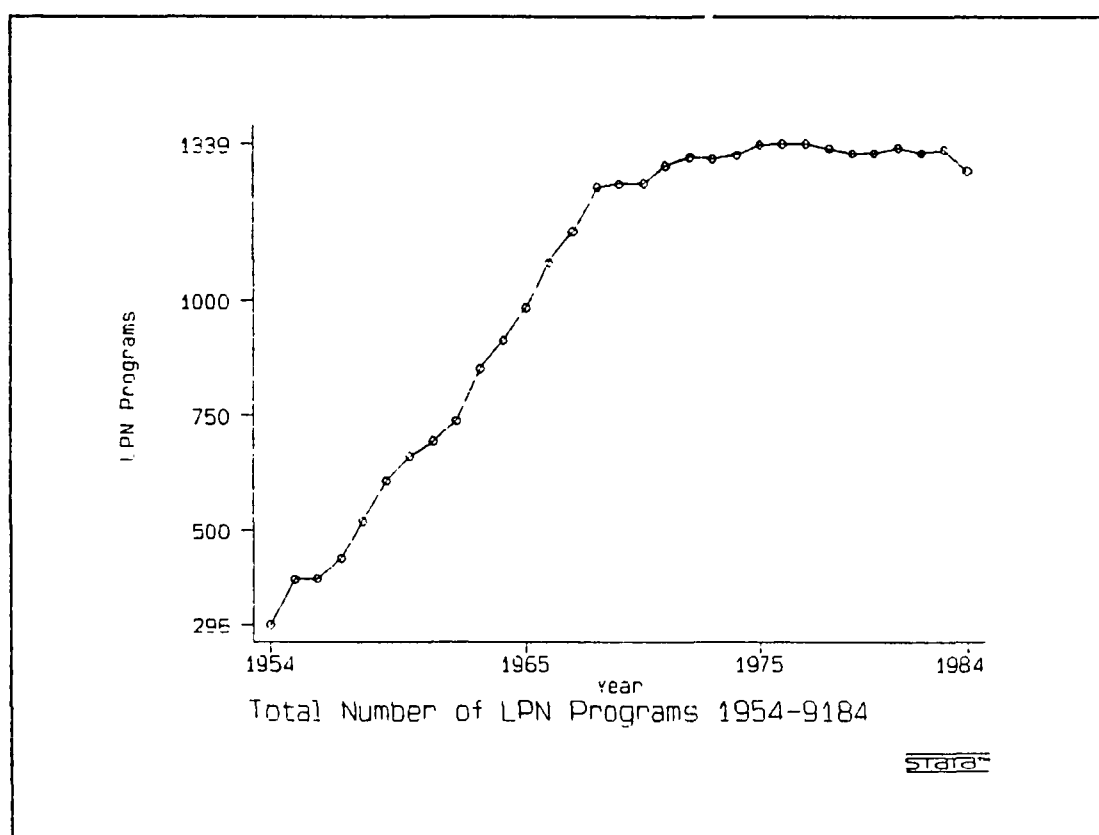


Figure 14. Trends in LPN Programs 1954-1984

Nursing as an occupation and as a profession existed on three levels: auxiliary health care workers, LPNs, and RNS; and registered nursing existed on three educational and

functional levels: diploma nurses, ADN nurses and BSN nurses. While there had been some cleavage between BSN and diploma nurses, this had not heretofore caused divisiveness either within the nursing role or between groups of nurses. The impetus for rigid stratification came with the growth of the community college or ADN graduate. This growth has been as dramatic as the decline of the diploma nurse and has attenuated the more steady but gradual growth of baccalaureate nursing. Further evidence of divisiveness or conflict within nursing came not from economic stratification but social stratification within the ranks of nurses.

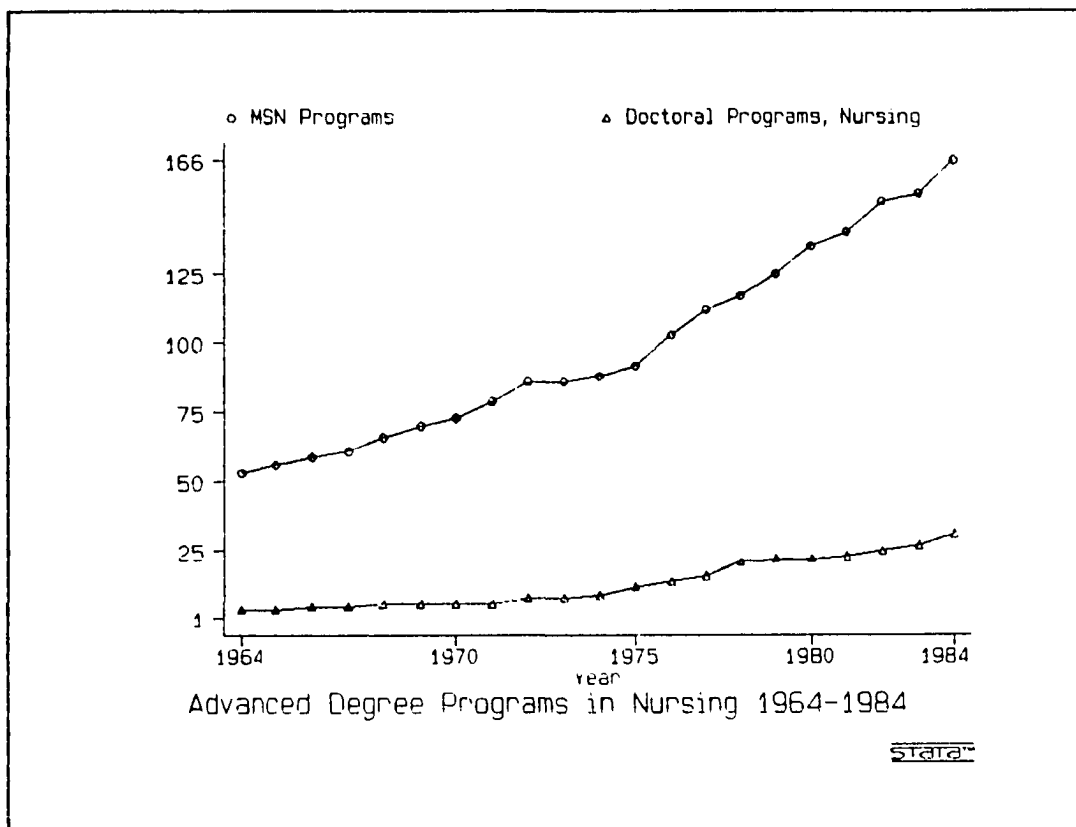
At this time BSN and ADN salaries were similar, but the women entering these two groups represented different social strata. More and more, BSN nursing drew from the ranks of the middle class, whereupon this level of nursing had formerly attracted largely working class or lower middle class women, looking for advancement. ADN programs, on the other hand drew most of their students from older, married and often single head of household women from working class origins. As the number of ADN graduates increased into the 1960s and 1970s, educational and class issues were translated into functional and practice issues, focusing on "turfism" and salary.

#### **The Women's Movement and Female Labor Reform**

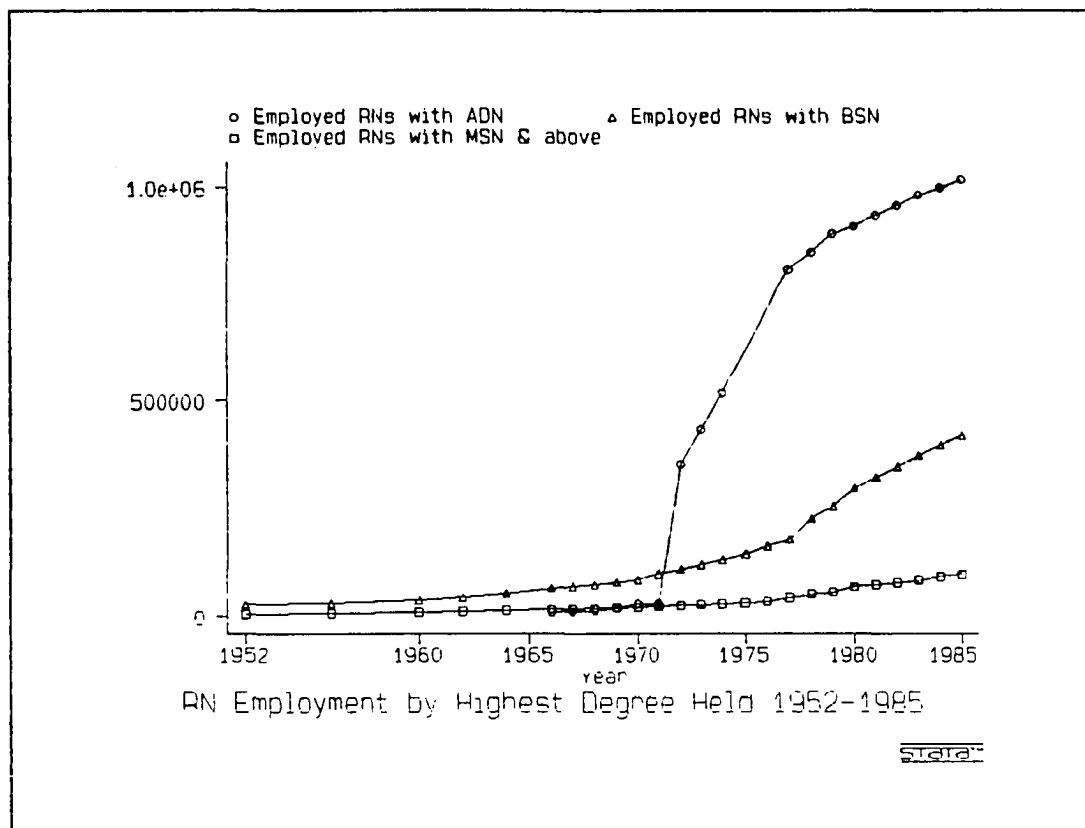
The decade of the 1960s saw tremendous change in female labor force participation and the composition of nursing practice. In 1960 there were 23 million women in the labor

force and every third worker (32 percent) was a woman. Three million of these women were non-white, 97 percent of whom were black. The proportion of married women in the workforce increased to beyond 60 percent. Occupations varied widely, but teaching and nursing held onto their share of women workers with 13 percent of all working women being in the professional occupation category, an increase of 1.25 million over the previous decade. Forty-five percent of professional women were teachers (excluding college teachers) and 74 percent of teachers were female. Ninety-eight percent of nurses were women, and nursing accounted for 13 percent of all female workers. The percentage of female physicians remained at about the 7 percent level across the decade.

The educational status of women improved throughout the decade. Women continued the educational gains made in the 1950s. 38 percent of women in the labor force had completed high school, while 6 percent had graduated from college. The percent of female PhDs climbed from 10.2 in 1960 to 13.4 in 1970, a tremendous upturn, following on the heels of the 1950s decline. (Refer to Figure 4. p. 93) Nurses continued to seek higher education at the baccalaureate level and above. Figure 15. shows the opening and expansion of MSN and doctoral programs in nursing which began a slow but steady climb in 1964. Degreed RNs, especially ADNs began to predominate the labor force. (See Figure 16)



**Figure 15. Trends in Advanced Nursing Programs**



**Figure 16. Trends in Degreed RN Employment**

Nursing benefitted both from the general expansion of female labor force participation and the increasing tendency for RNs to stay in the labor force. The labor force activity of RNs and LPNs in the 1960s shows rapid and steady growth. (See Figure 17. and Refer to Figure 3. p. 84) Older and more married RNs were remaining in or reentering the labor force during this period, and the ratio of active to inactive RNs was highest for younger nurses. (See Figure 18)

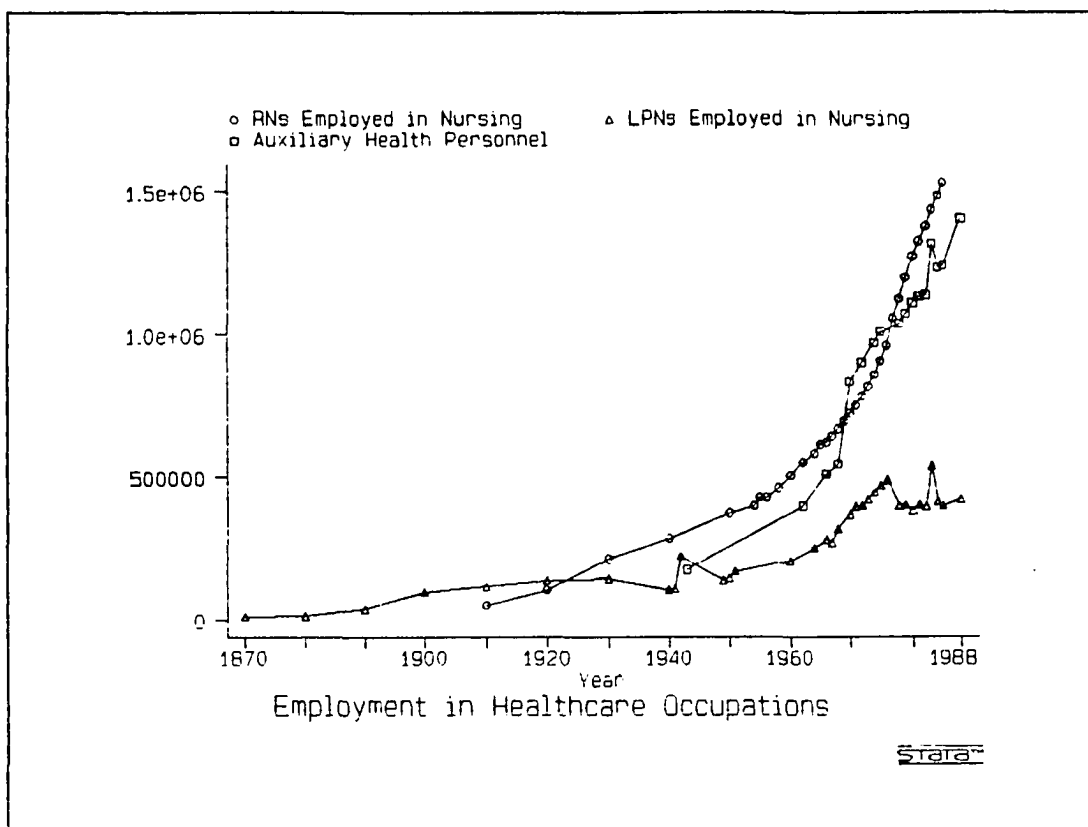


Figure 17. Trends in Healthcare Employment Options

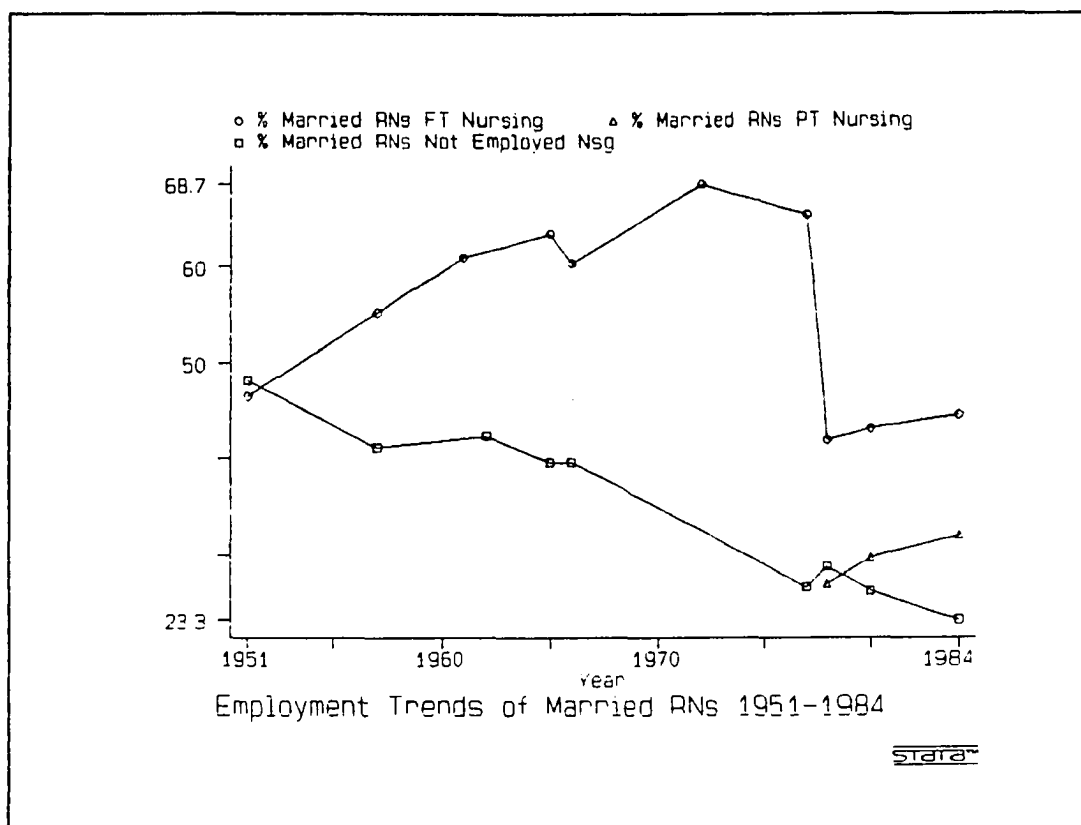


Figure 18. Married RNs in the Workforce

Nursing in the Decade for Women: 1976-1985. Employment developments in the "Decade for Women", so identified by the World Conference on the United Nations Decade for Women, characterize a period of rapid social change. Employment for women had progressed in terms of the number of women entering or in the labor force and in terms of the quality of jobs accessible to women. Women have consolidated gains in education and training, and legislation has improved the working life of many women.

The proportion of women in the labor force has grown from one-third in 1950 to more than one-half, 54 percent, in the 1980s, and the number of women in the labor force grew to 50 million in 1985. Since 1970, nearly half of the increase in the number of women workers has been among those age 25 to 34. In the 1980s one out of four women is in this age group. Seventy percent of all women in the labor force today are in the 25 to 54 year age group. Although labor force participation rates for men still continue to exceed those for women, the gap is narrowing considerably, indicating the demise of a sexual division of labor based on the public/private sphere duality.

While the labor force participation rate for white women across the decade has grown more rapidly than for minority women, there is now relatively little difference between the two groups (55 and 53 percent respectively). The female labor force in this decade has also grown more diverse. Black women numbered 10.7 million in 1984 with 5.9 million in the labor force. Hispanic women numbered 5.7 million in 1984 with 50 percent in the labor force. Additionally, more than 2 million other minority women, mainly Asian, have entered the labor force in the 1980s.

Sweeping social change has altered woman's role in American society, and this has affected both the workplace and the home and family. In the 1980s four out of every ten workers are female with 52 percent of all married couple



families in the labor force. The number of working mothers, both married and single, has increased to nearly 20 million in 1984. The number of women head of households has continued to increase with 61 percent of them in the active labor force.

As an extension of women's actions and activism in the 1960s and 1970s, promising trends have continued in women's educational attainment. While the number of female high school graduates peaked in 1977, more women than ever are staying in school, graduating from high school and going on to college than ever before. The number of female baccalaureate degrees has increased steadily with women now accounting for more than half of all students enrolled in institutions of higher learning. The proportion of female PhDs have also continued to increase to a high of 33.6 percent in 1984.

Unfortunately these gains in education are not matched by similar gains in earning power. While the earning's gap between male and female workers continues to narrow, another 5 percent during this decade, women workers have not achieved parity with their male counterparts. Although there are a number of factors affecting female earnings, it is generally agreed that the concentration of female workers in sex-typed or female dominated professions and occupations accounts for much of the earning differential.

A large proportion of women workers in this decade joined the ranks of other women in "traditional" female occupations and professions, such as non-college teaching and nursing. The

major exception to this trend in the health care area is the continued and sustained growth of women in medicine. The proportion of female physicians grew to 17.2 in 1985 and has continued to climb to 20.0 percent in 1988. Unfortunately, salaries for female physicians, who tend to work fewer hours and are concentrated or "ghettoized" in lower paid specialties, such as pediatrics, psychiatry, and family practice, are paid below the level of their male colleagues.

Women's occupational patterns change slowly, and by the middle of 1980 three-fifths of all professional women remained in the traditional occupations of teaching and nursing. In 1984 nursing was the fourth largest employer of women and 96 percent of all nurses were female. Elementary school teaching ranked as the sixth major employer of women (secondary school teaching ranked fifteenth) and 73 percent of all non-college teachers were women.

The picture of nursing and nurse employment is changing, however. There continues to be a precipitous decline in diploma nursing programs and the number of diploma nurses in the workforce (Refer to Figures 8, 11, and 13 pgs. 101, 112 and 115) matched by a driving upward trend in the training and employment of ADN nurses. Baccalaureate nurses, and nurses with advanced degrees, have continued to make modest gains during the 1970s and 1980s with isolated years of "two-step" movement. (Refer to Figures 8, 15 and 16 above). The total number of nurses employed in nursing has risen from 1.3

million in 1980 to 1.5 million in 1985 with a concurrent increase in the Full Time Equivalency (FTE) ratio of nurses to population of 470/100k population in 1980 to 533/100k population in 1985. These increases in nurse to population ratio apply for both BSN and ADN nurse groups.

The education and labor force participation for LPNs remains quite steady. (Refer to Figures 9 and 17 above) Figure 19. shows an upward trend in licensure with recoveries in 1981, 1983 and 1985. The employment of LPNs in hospitals and nursing home settings continues to grow at a reasonable pace, as seen in Figures 20. and 21.. Unemployment rates for LPNs are higher than for RNs and present a less consistent pattern over time. (See Figure 22.)

Unemployment rates for RNs remain lower than unemployment rates for all other categories of workers, indicating that nurses are working, want to work and are employed in the labor force. (Figure 22.) Registered nurses continue to staff the nation's hospitals and the number of both full and part-time workers soared in 1980 and has continued to climb in 1984 and 1985, as seen in Figure 20.. In 1984 hospitals employed 68 percent of all registered nurses and 58 percent of all LPNs. Nursing homes employ a relatively small percentage of registered nurses and only a slightly larger number of LPNs. Most patient care in nursing homes is given by auxiliary nursing personnel. (Refer to Figure 21.)

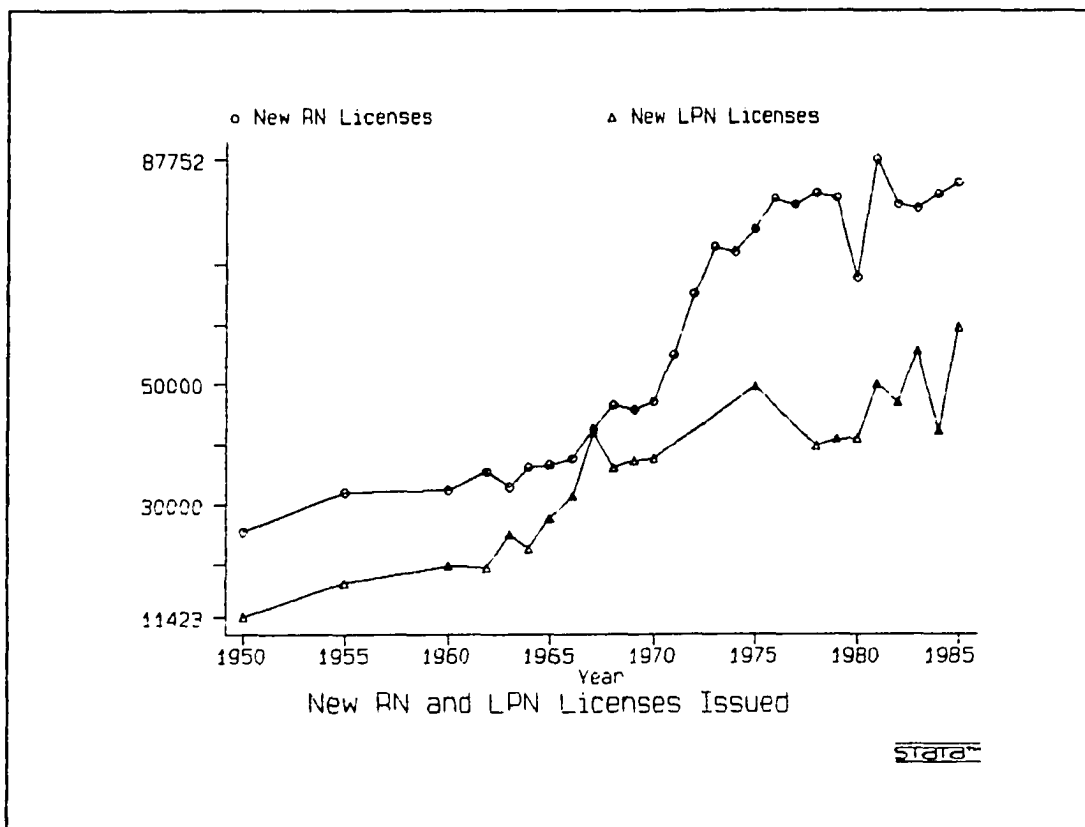


Figure 19. Trends in RN Licensing

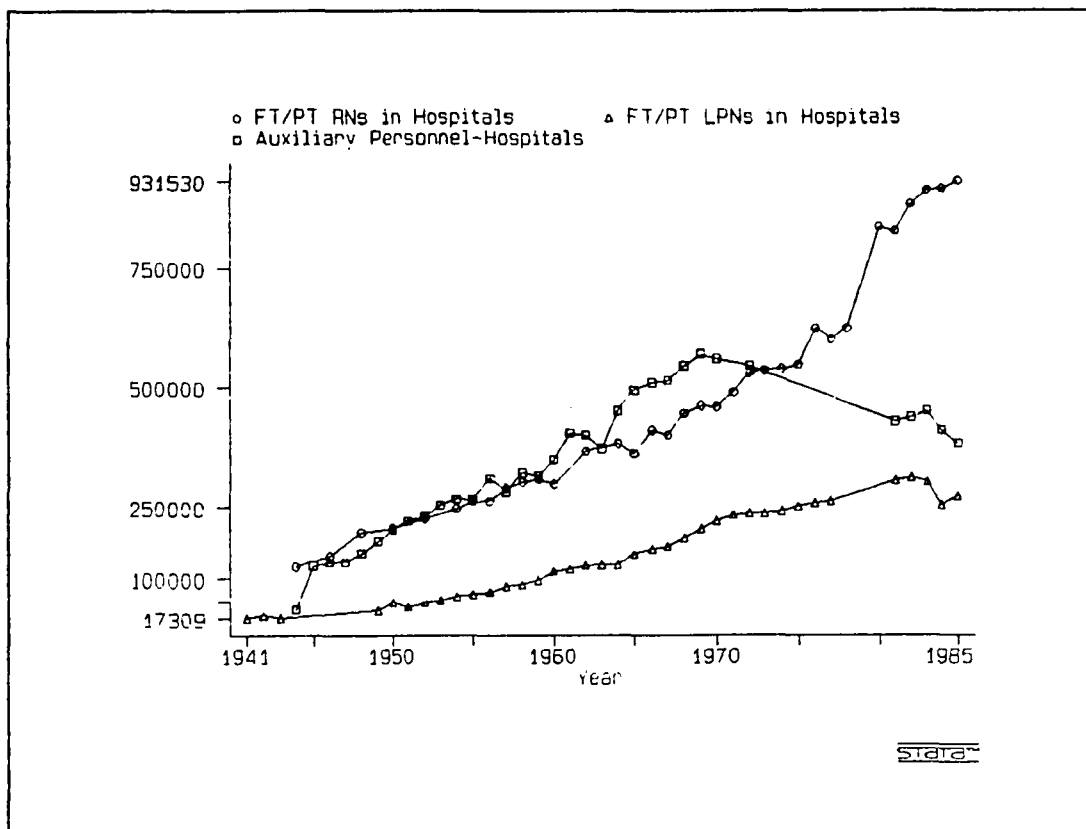
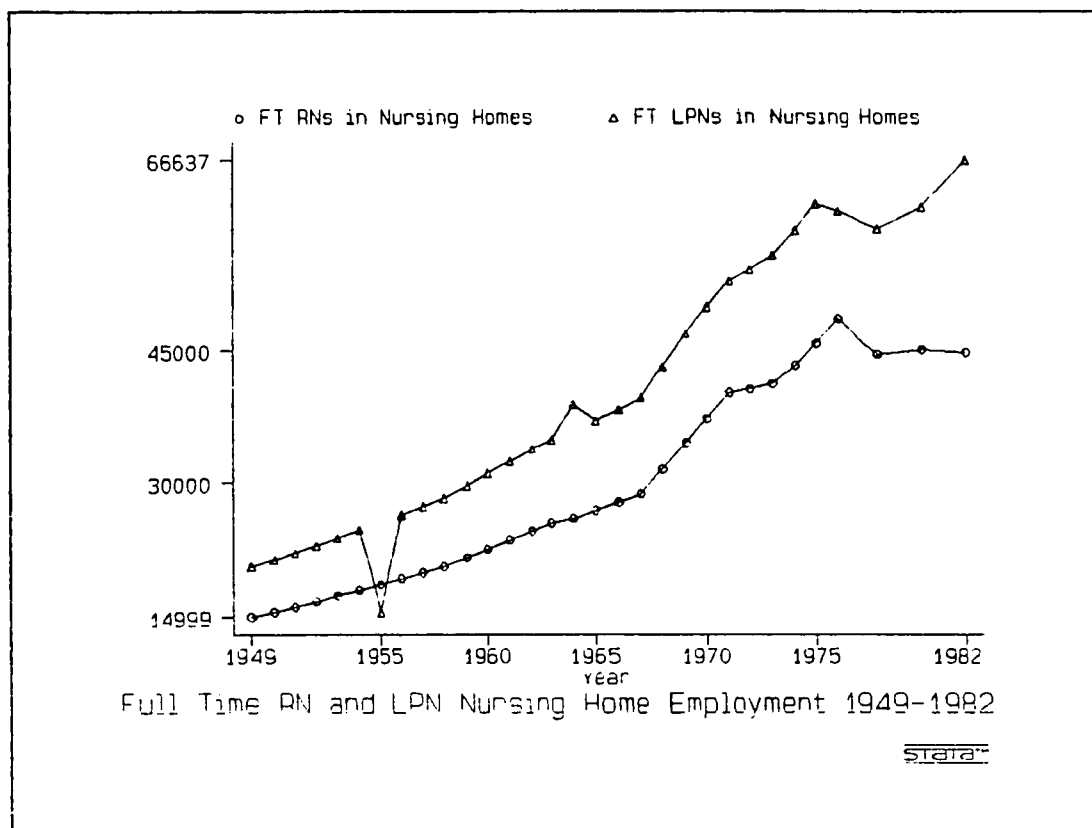
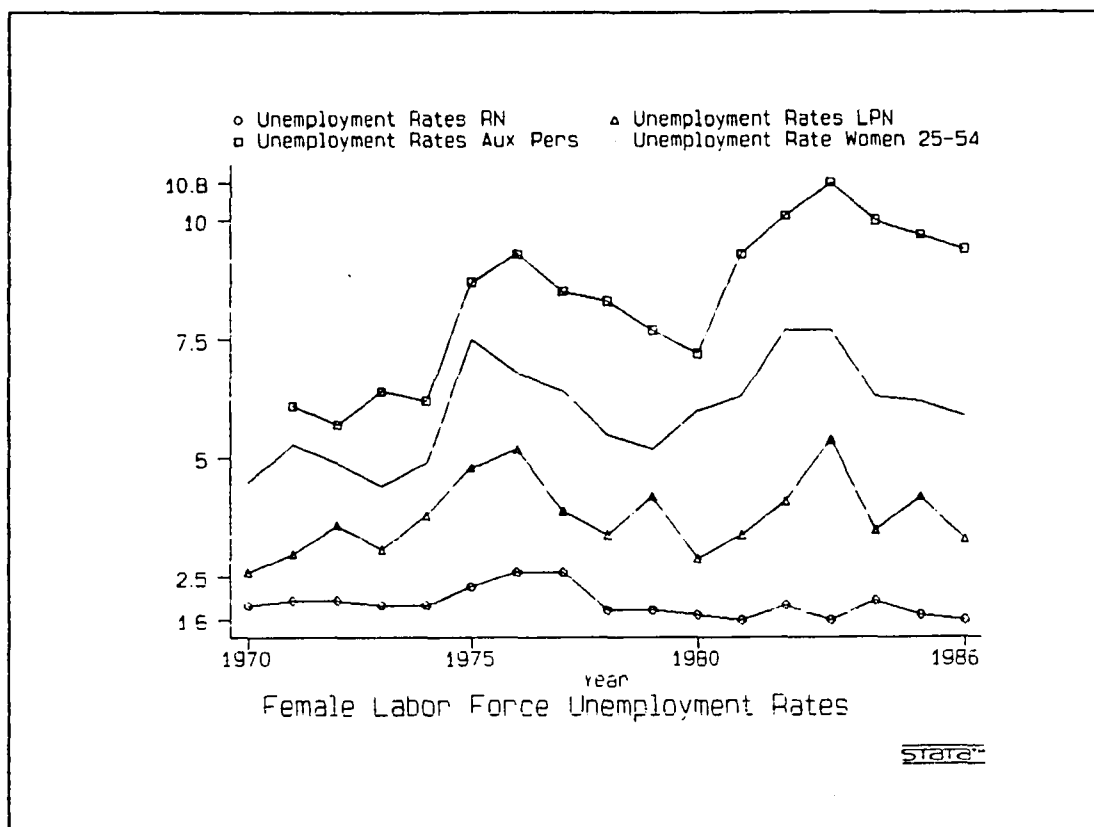


Figure 20. Trends in Hospital Healthcare Personnel



**Figure 21. Trends in RN and LPN Nursing Home Employment**



**Figure 22. Female Unemployment**

The number of registered nurses seeking licensure during this decade has increased with the noted slump in 1980, which is almost entirely accounted for by incomplete data collection for that year. (Refer to Figure 19 above) RNs seeking licensure for the period of 1970 to 1985 have consistently been new graduates, sitting for examination, as seen in Figure 23.. Nurse mobility is evident in the overall increase in nursing licenses obtained by endorsement, and reentry into nursing is indicated by the increase in license reinstatements, particularly in 1985, although this "jump" should be viewed

with caution, as this reporting period saw a more complete and accurate data collection effort.

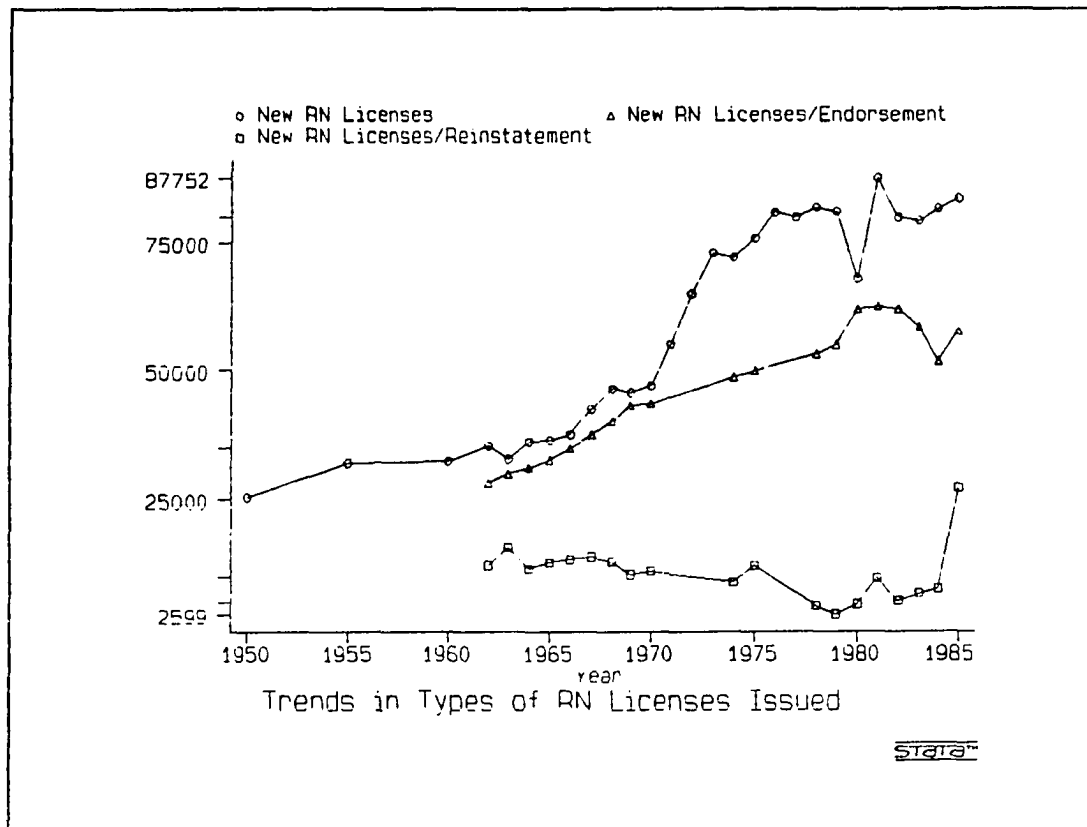


Figure 23. RN Licensure

Overall the trend of nurse requirement and availability from 1870 to 1988 shows sustained labor force activity and an increase in the number of nurses in the labor force. The most notable aspect of this trend is the change in composition of nursing and nurses in both training and practice. The hierarchical nature of nursing is evident in its development over the last one hundred years. The health care industry is still characterized by a marked sexual division of labor



between medicine and nursing and hospital administration and nursing, although women are gaining a foothold in both medicine and the executive ranks of the hospital hierarchy. Nursing itself is stratified racially and economically with the RN population still disproportionately white. Blacks and minority nurses are much more integrated at the lower levels of nursing with 25 percent of all female auxiliary workers, and 22 percent of all LPNs being black or minority labor force participants, as opposed to blacks and minorities constituting 8.2 percent of RNs in the 1984.

Nurses' earnings, while continuing to rise overall, are tied to employment setting. Nursing education with the largest number of highly educated and largely white nurses is at the top of the earning's ladder. Hospital employees receive salaries commensurate with both training and experience, so that the educational differential is less at the staff level than in the administrative and supervisory ranks. Those nurses employed in nursing homes at all levels receive considerably lower wages than do hospital nurses.

### Scatterplot Matrices

Relationships between the most promising variables hypothesized to explain nurse requirement and availability were explored by calculating correlation coefficients and constructing scatterplot matrices. Many independent variables

had to be eliminated immediately on non-theoretical grounds, because the number of cases was too low. Hypotheses relating to illness acuity, number of nursing home residents, and hospital vacancy rate were untestable for this reason. Hospital vacancy rate could not be properly measured with the available data.

Other variables, which might have been plausible independent variables also failed to yield even a minimum number of cases. This is an all too common and unfortunate problem with time series data.

The remaining major variable associations are presented in Figures 24-31. For each scatterplot matrix, there is the corresponding numerical correlation matrix for comparison and verification.

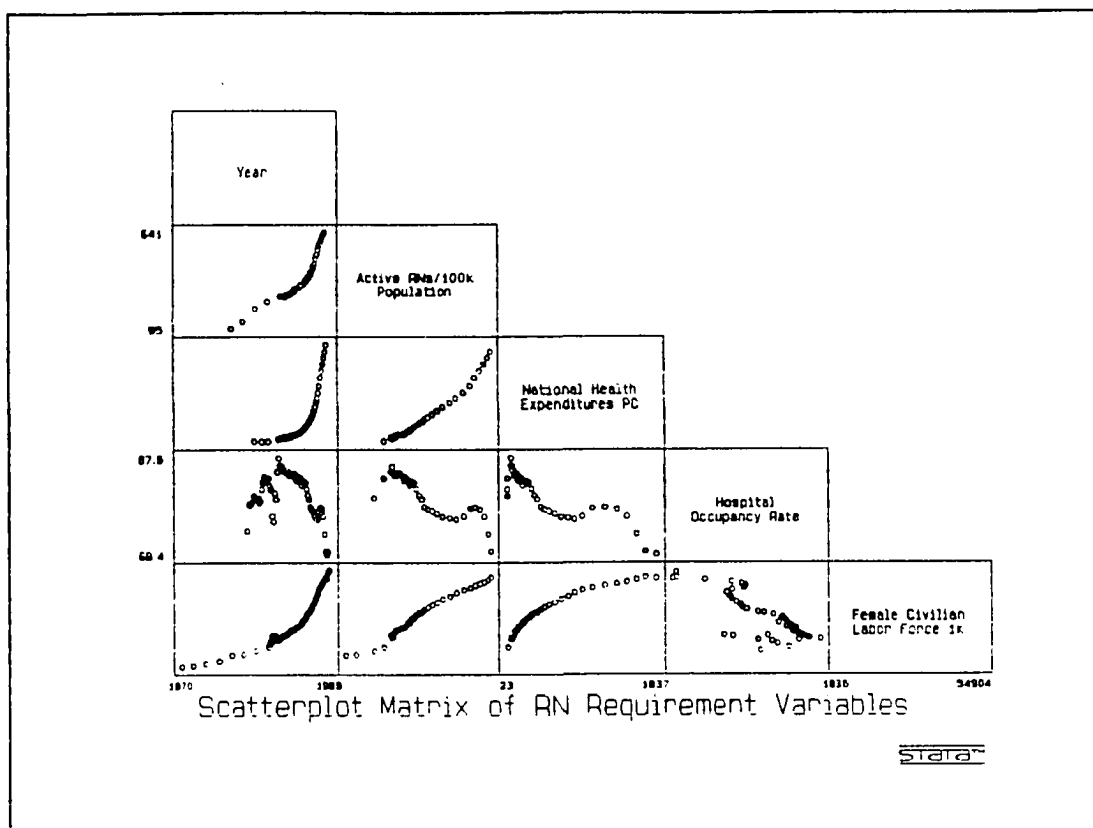


Figure 24. RN Requirement

(obs=33)					
	year	RNlabfor	Hlthexpc	HospOcRT	FlabFor
year	1.0000				
RNlabfor	0.9279	1.0000			
Hlthexpc	0.8623	0.9812	1.0000		
HospOcRT	-0.8806	-0.9064	-0.8841	1.0000	
FlabFor	0.9722	0.9867	0.9460	-0.9208	1.0000

Figure 24A. Correlation Matrix of RN Requirement

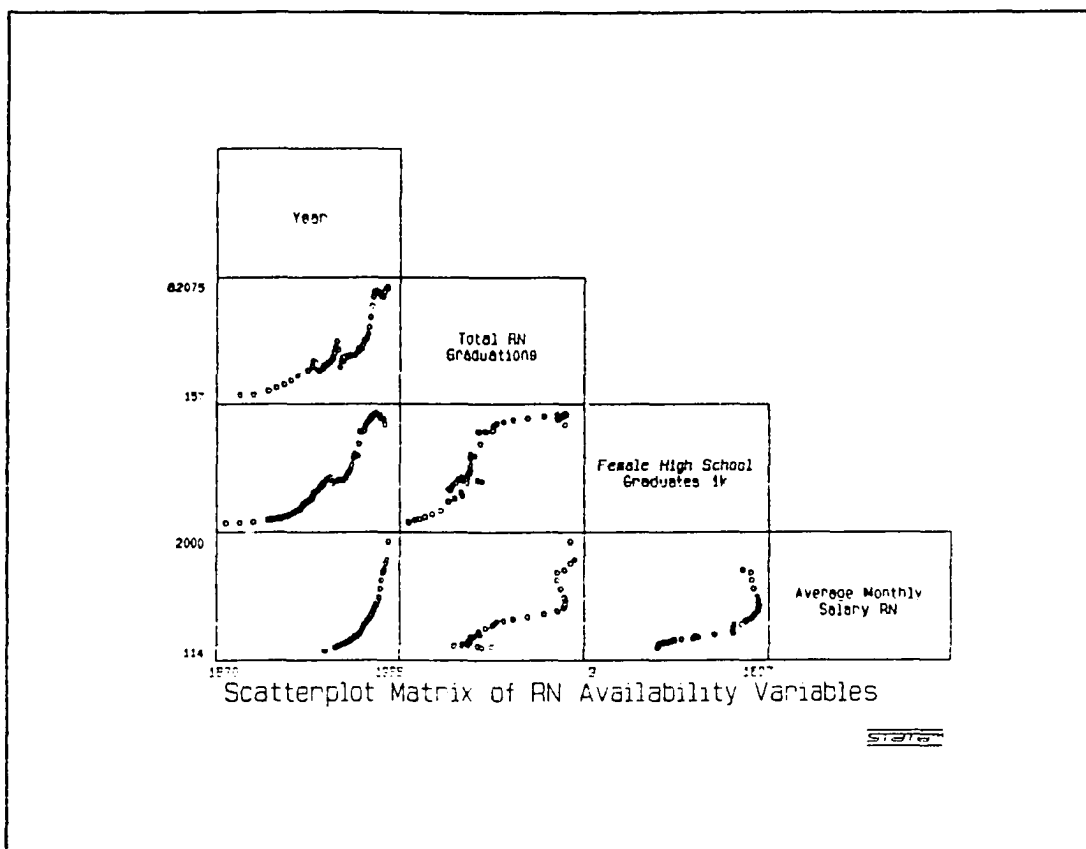


Figure 25. RN Availability

(obs=34)

	year	RNGrads	FHSGrads	RNSalary
year	1.0000			
RNGrads	0.8847	1.0000		
FHSGrads	0.9432	0.8161	1.0000	
RNSalary	0.9245	0.9128	0.7890	1.0000

Figure 25A. Correlation Matrix of RN Availability

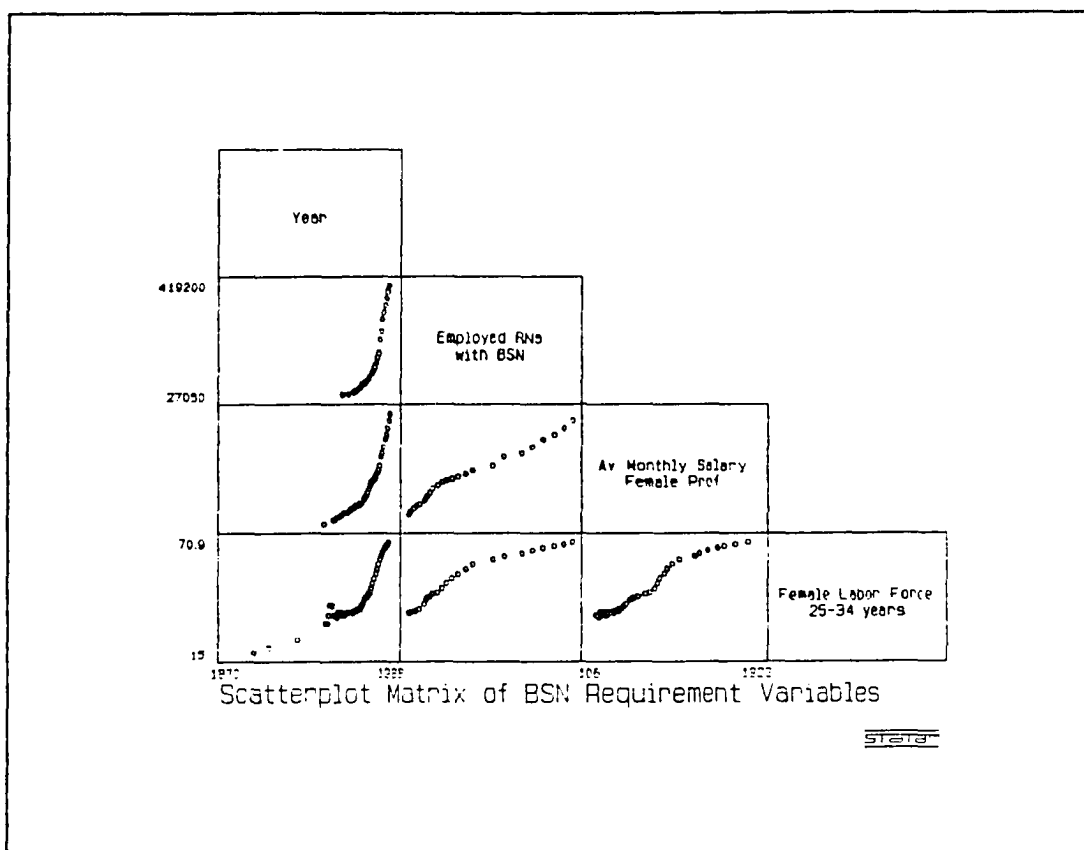


Figure 26. BSN Requirement

(obs=25)				
	year	BSNemp	FProSal	FLF25y34
year	1.0000			
BSNemp	0.8972	1.0000		
FProSal	0.9415	0.9887	1.0000	
FLF25y34	0.9550	0.9607	0.9737	1.0000

Figure 26A. Correlation Matrix of BSN Requirement

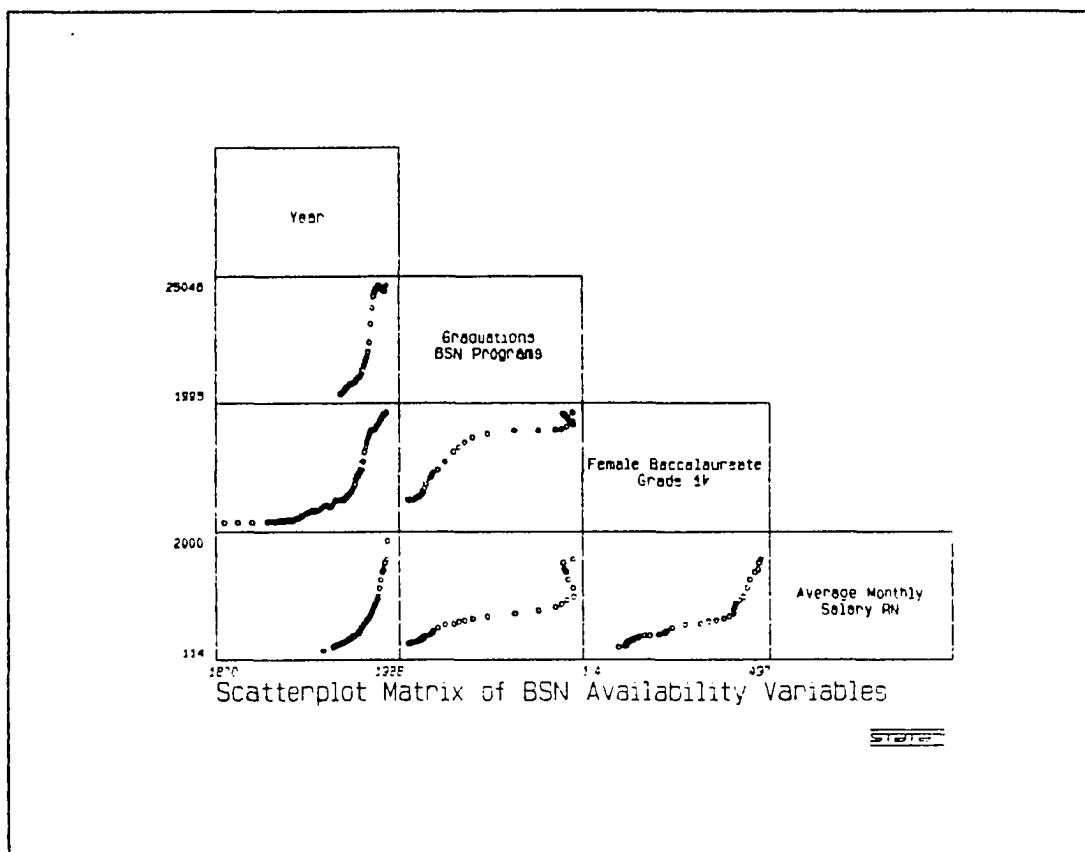


Figure 27. BSN Availability

(obs=34)

	year	BSNGrad	FBacGrad	RNSalary
year	1.0000			
BSNGrad	0.9402	1.0000		
FBacGrad	0.9802	0.9403	1.0000	
RNSalary	0.9367	0.9243	0.9074	1.0000

Figure 27A. Correlation Matrix of BSN Availability

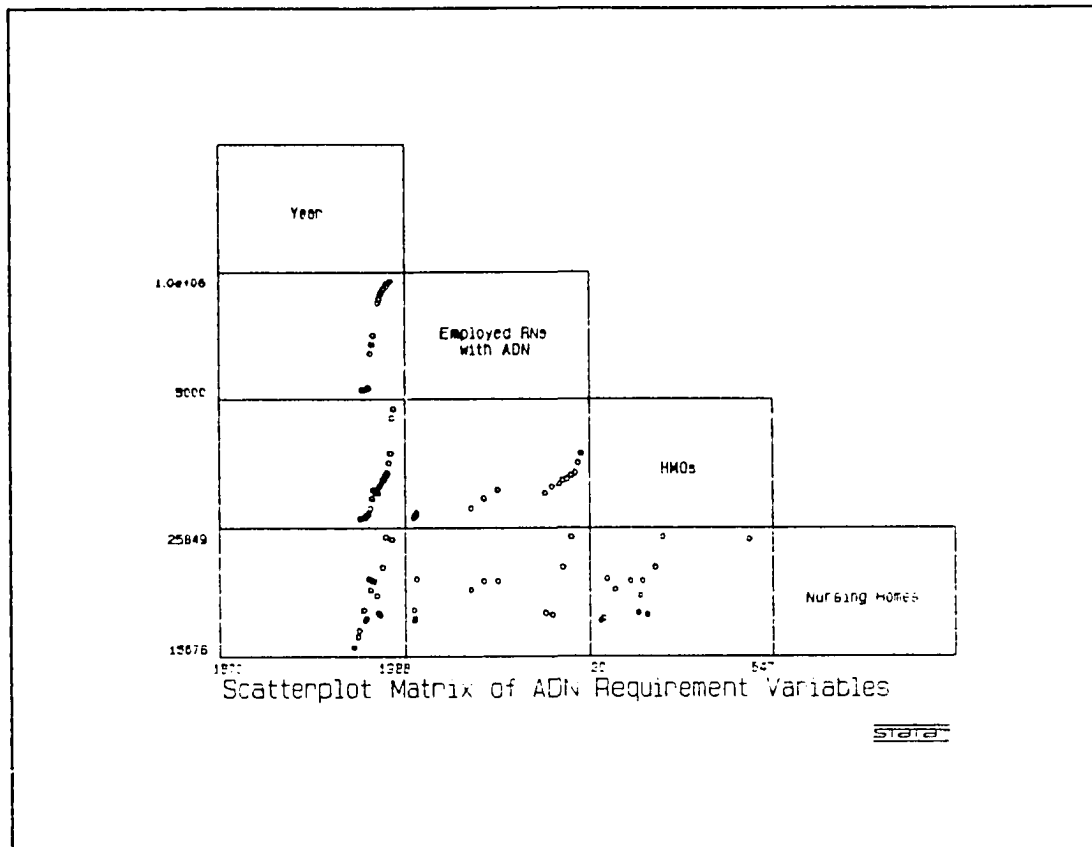


Figure 28. ADN Requirement

(obs=10)				
	year	ADNemp	HMOs	NurHomes
year	1.0000			
ADNemp	0.9669	1.0000		
HMOs	0.9649	0.9588	1.0000	
NurHomes	0.5954	0.4421	0.5997	1.0000

Figure 28A. Correlation Matrix of ADN Requirement

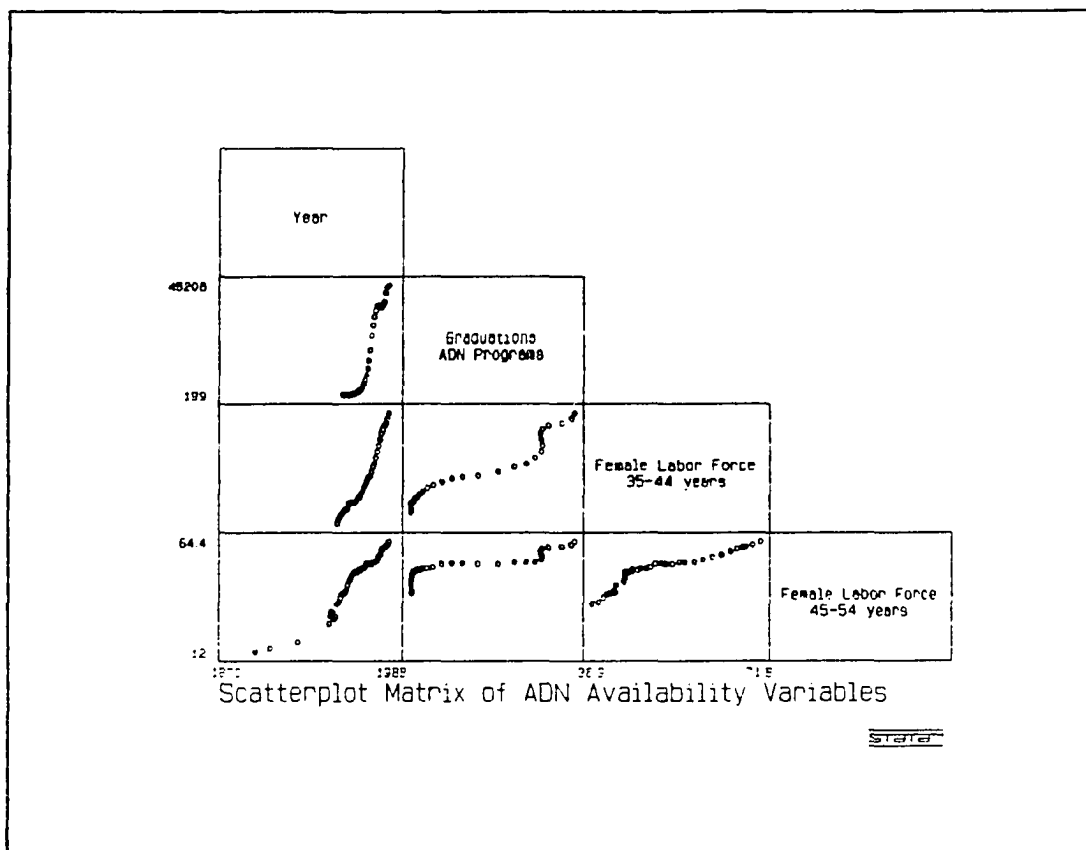


Figure 29. ADN Availability

(obs=34)

	year	ADNGrad	FLF35y44	FLF45y54
year	1.0000			
ADNGrad	0.9407	1.0000		
FLF35y44	0.9638	0.9684	1.0000	
FLF45y54	0.9713	0.8651	0.9318	1.0000

Figure 29A. Correlation Matrix of ADN Availability



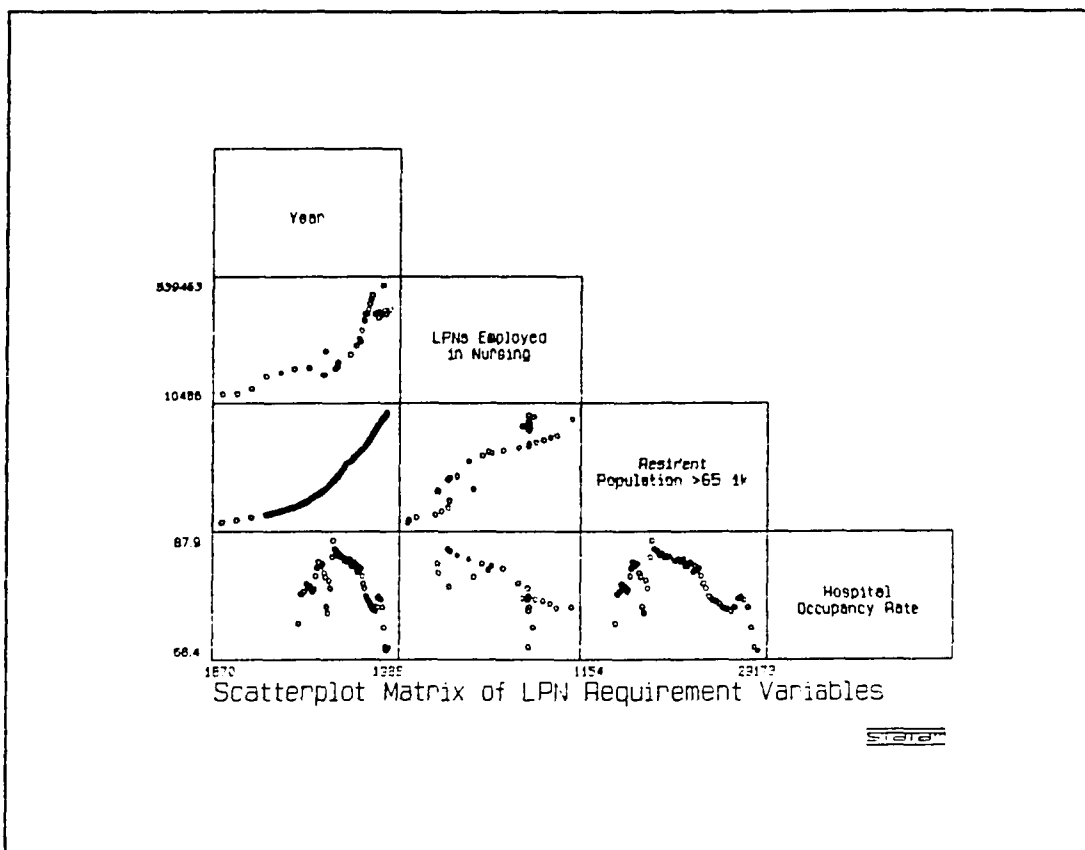


Figure 30. LPN Requirement

(obs=27)				
	year	LPNemp	Respop65	HospOcRt
year	1.0000			
LPNemp	0.9013	1.0000		
Respop65	0.9923	0.8964	1.0000	
HospOcRt	-0.7100	-0.7762	-0.7636	1.0000

Figure 30A. Correlation Matrix of LPN Requirement

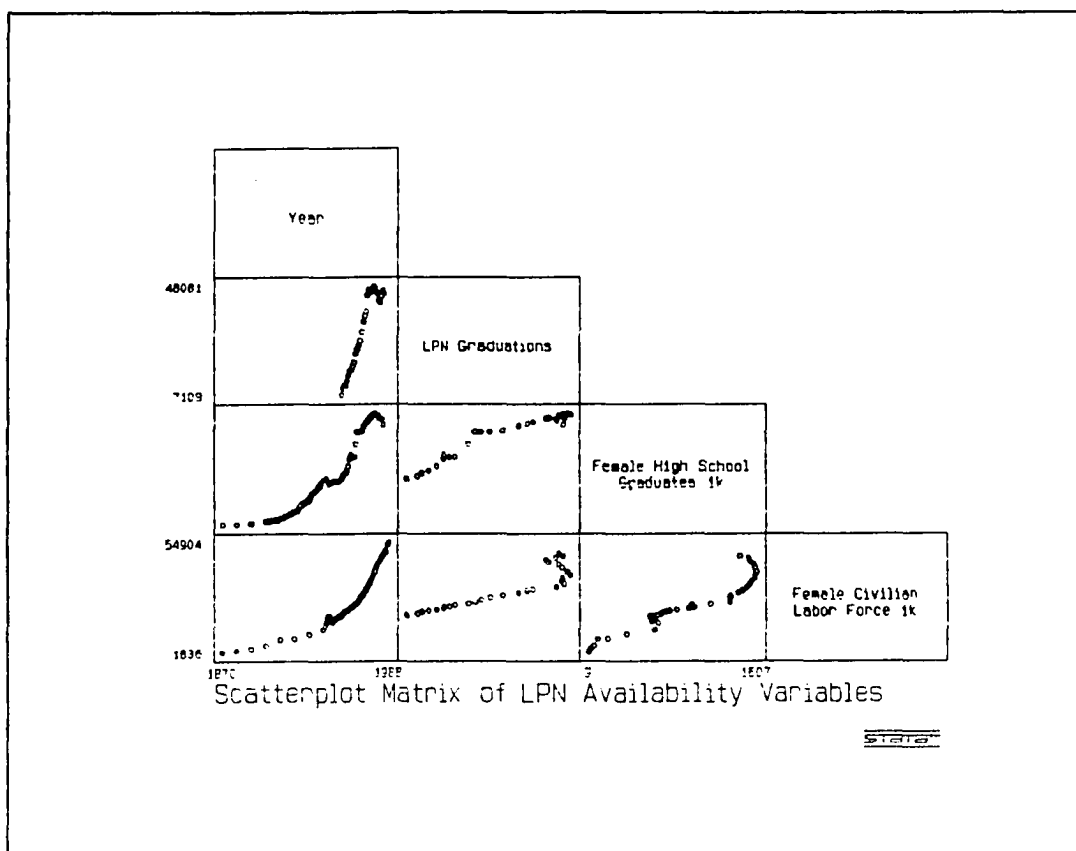


Figure 31. LPN Availability

(obs=30)

	year	LPNGrad	FHSGrads	FLabFor
year	1.0000			
LPNGrad	0.9521	1.0000		
FHSGrads	0.9192	0.9645	1.0000	
FLabFor	0.9820	0.9016	0.8402	1.0000

Figure 31A. Correlation Matrix of LPN Availability

Figure 24. shows the relationship between variables thought to be related to nurse requirement. This scatterplot matrix shows the increase over time of female civilian labor force participation, national health expenditures per capita ( $r=.86$ ), and RNs employed in nursing, the planned endogenous or dependent variable. Hospital occupancy rate decreases over time. Female civilian labor force and hospital occupancy rate are strongly positively correlated with RNs employed in nursing, while hospital occupancy rate is negatively correlated with RNS employed in nursing. Simple correlations among the other variables are very high.

Figure 25. shows the relationship between RN availability and major social structural variables. This scatterplot matrix shows that total RN graduations, the identified endogenous or dependent variable, and both exogenous or independent variables increase over time. Female high school graduates and average monthly female professional salary both have strong positive correlations with total RN graduations. Once again simple correlations are also very high and are strongly positive. These matrices foreshadow inescapable difficulties for multivariate analysis. The data show very high levels of multicollinearity and autocorrelation. Consequently, we can place little faith in regression parameter estimates or significance tests.

Figure 26. shows a scatterplot matrix of variables thought to be related to BSN nurse requirement. Employed BSNs,

the expected dependent variable and both independent variables, average monthly salary of female professionals and female labor force participation 25-34 years show strong upward trends over time. Both independent variables are strongly positively related to employed BSNs and to each other.

Figure 27. illustrates relationships between BSN graduations and female baccalaureate graduations, average monthly RN salary, all of which increase over time. Female baccalaureate graduations and average monthly RN salary are strongly positively correlated with graduations from BSN programs. All variables have strong positive correlations with each other as well.

Figure 28. shows ADN requirement as employed ADN nurses increasing over time. Number of HMOs (health maintenance organizations, a health care cost constraint measure) and number of nursing homes also increase very sharply over time. The two independent variables have a moderate positive simple correlations.

Figure 29. presents a scatterplot matrix of ADN availability variables. ADN graduations increase over time just as did BSN graduations. Female labor force participation for the age groups 35-44 and 45-54 years also increase over time. Strong positive correlations exist between the two likely predictor variables as well.

Figure 30. and Figure 31. give scatterplot matrices of LPN requirement and availability. LPN employment, as a measure

of requirement, and resident population over age 65 both increase over time. As stated earlier hospital occupancy rate decreases over time. Resident population over age 65 is strongly positively correlated with LPN employment, and hospital occupancy rate is strongly negatively correlated with both.

With regard to LPN availability, female LPN graduations, female high school graduates and female civilian labor force all increase over time exceeding  $r=.9$ . Female high school graduations is strongly positively correlated with LPN graduations, and so is female civilian labor force employment. These two variables are also strongly positively correlated with one another.

In addition to the aforementioned statistical problems, multicollinearity and autocorrelation, substantial curvilinearity is also apparent in these scatterplot matrices. This is particularly evident in graph of the BSN requirement and availability variables. It is also apparent in the ADN and LPN availability variables. Nonlinear transformations may help us to model these data. We will also explore simple methods of subtracting trends from the data, to get a closer look at the non-trend variations that remain.

#### CHAPTER IV ENDNOTES

1. See Hamilton, Modern, 43-51, for a more complete discussion of time plots.
2. See Hamilton, Statistics, 64, for further discussion of the value of correlation scatterplot matrices.
3. Hill, 17-28.
4. Hill, 28-45.
5. Harriet Martineau, Society in America (New York, 1837) Vol. II.
6. Barbara Welter, "The Cult of True Womanhood, 1820-1860," American Quarterly (Summer, 1966, Part I) 151-174.
7. See Ehrenreich and English, 23-30, for a more involved discussion of women in health care in the Reform Age.
8. Little information is available about nurses and midwives during this period, even Gerda Lerner in her article "The Lady and the Mill Girl: Changes in the Status of Women in the Age of Jackson," in Jean E. Friedman, William G. Shade, and Mary Jane Capazzoli, Our American Sisters: Women in American Life and Thought Fourth Edition (Lexington, MA, 1987) 125-137, does not discuss nursing, as it had not become an organized profession at that time.
9. Lerner in Friedman, et al., 125-137; Barbara Mayer Wertheimer, We Were There: The Story of Working Women in America (New York: Pantheon Books, 1977) 62-106.
10. Thorstein Veblen, The Theory of the Leisure Class (Hamondsworth: Penguin, 1969; first publication 1899) 68-101,; 167-187.

11. Gerda Lerner, The Grimke Sisters from South Carolina: Pioneers for Woman's Rights and Abolition (New York: Schocken Books, 1967) 138-147, 187-204.

12. Flexner, 25.

13. Carroll Smith Rosenberg, Disorderly Conduct: Visions of Gender in Victorian America (Oxford: Oxford University Press, 1985); Frances B. Cogan, The All-American Girl: The Ideal of Real Womanhood in Mid-Nineteenth Century America (Athens: The University of Georgia Press, 1989).

14. Julie A. Matthaei, An Economic History of Women in America: Women's Work, the Sexual Division of Labor, and the Development of Capitalism (New York: Schocken Books, 1982) 187-230.

15. No one is certain what accounts for the 1890-1910 increase in the number of male nurses. It is likely that two factors are explanatory of this phenomenon: the decrease in the number of female midwives during this period, resulting from medical professionalization and technological advances in obstetrics; and the professionalization of nursing, making it an appealing occupation for males. Indeed early Nightingale-inspired nursing programs in the United States did recruit males, especially those who performed medical duties during the Civil War and the Spanish-American War.

16. Schools of nursing, or nursing schools, differ from nursing programs in both definition and number. Nursing programs identify an actual course or program of study, eg. diploma, ADN, BSN, MSN, LPN, etc., which is accredited (after state accreditation laws were enacted) by the state and often the NLN, as meeting the curricular criteria for preparation of nurses (RN or LPN). When these nurses have successfully completed their studies, they are graduated and then eligible to take standardized state licensure examinations (again after c. 1900, when accreditation laws were enacted and licensure regulations adopted and enforced). Schools of nursing house a nursing program or several nursing program within a single facility. A school of nursing is a hierarchical system which administers a nursing program, or nursing programs, for eg., The University of North Carolina, Chapel Hill, School of Nursing maintains three nursing programs, BSN, MSN, DNSc. at the present time. Many hospital nursing schools have traditionally maintained LPN, diploma and BSN programs, operating concurrently, for example, Queens Hospital Center,

L. I., NY, which for a period in the 1960s and 1970s had three separate nursing programs in simultaneous operation.

17. Ashley, "Nursing and Early Feminism," 69.

18. The number of employed black nurses is unavailable for this time period, as many hospitals, the leading employer of all nurses, did not indicate race on their records.



## CHAPTER V

### DATA ANALYSIS II: REGRESSIONS AND RESIDUAL PLOTS

The scatterplot matrices in the last chapter revealed major statistical problems:

1. multicollinearity
2. autocorrelation
3. curvilinearity
4. sparse data.

The first three problems are essentially unsolvable because of the fourth. Consequently we cannot fit or test a formal model with these data. Instead we will construct predictive models, and use these to remove the major trends from the data. The left-over, residual variation can then be examined more closely for historical explanations of unexpected ups and downs.

#### Attempts to Cope with Statistical Problems

Multiple regression was used to test the hypotheses 8-15, listed in Chapter 3. This further confirmed serious multicollinearity, few degrees of freedom and positive autocorrelation in all regression analyses. The equations were then simplified in order to reduce the number of independent variables, and, since the N of the sample could not be

increased, alternative independent variables were chosen in an effort to reduce multicollinearity. To assess the significance of positive autocorrelation, the Durbin-Watson test was performed. In all regression analyses the Durbin-Watson test statistic was far out of range on the low or small side, thereby confirming the presence of positive autocorrelation in the residuals.

Attempts were made to solve the problem of positive serial autocorrelation by first respecifying the model to test linearity, as residuals can indicate autocorrelation when the relationship is really nonlinear. Nonlinear transformations neither improved the problem nor suggested reasonable alternatives. Modeling with the inclusion of lagged exogenous variables was then tried. This did not help either, although the Durbin-Watson test statistic was brought more into range for some of the regressions. Finally, after more work the examination of residual plots showed powerful upward trends in the data. Time was introduced as an independent variable in order to remove these trends. This was only partially successful. The choice, then, became one of accepting the equations as specified as the best "fit" to the data possible, given the small sample size and the data available, or redeveloping the model.

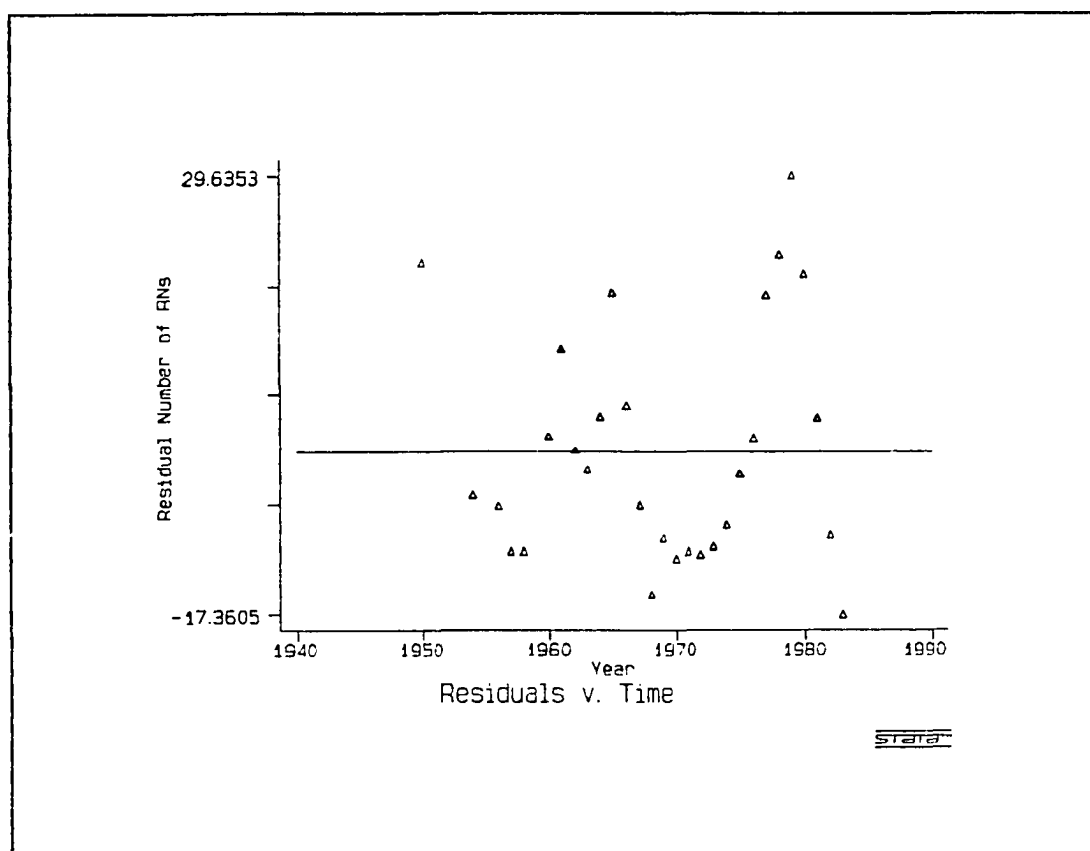
In an attempt to rework the equations more analyses of residual plots were performed. These analyses suggested an exciting new possibility, using the crude regression models

as filters, and concentrating our descriptive attention on the resulting prediction errors. This approach would indeed allow the "data to tell the story".

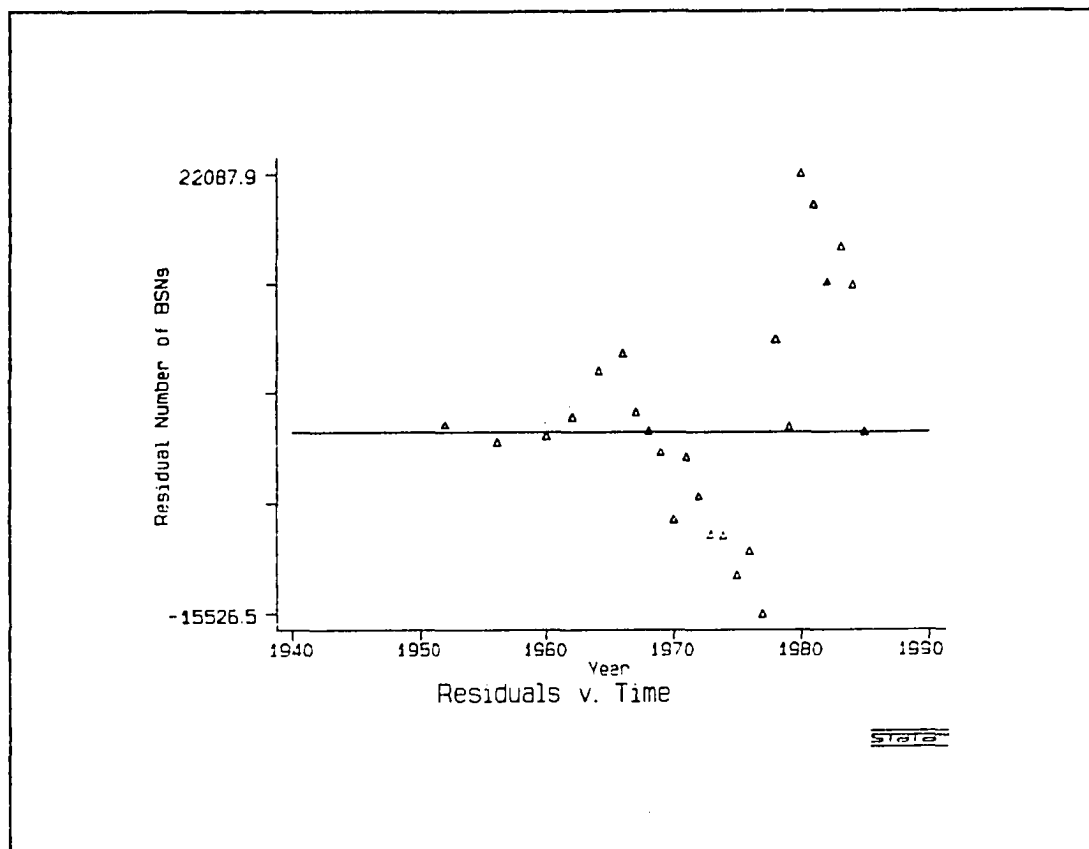
Analyses of residual plots enable us to further "read" the data. Residual plots are  $e$  versus time scatter plots. These are plots in which residuals ( $e$ ) are graphed on the vertical axis and predicted values of time are graphed on the horizontal axis. The horizontal line drawn at  $e=0$  on the graph is the mean of the residuals and represents the regression line. Cases plotted above the line have positive residuals, which mean that they are higher than predicted on the basis of the independent variable(s). Cases plotted below the line have negative residuals, meaning that they are lower than predicted.<sup>1</sup>

Figures 32-39. show residual plots for the regression equations written to test the hypotheses. The regression tables for each of the residual plots appear in Appendix C. and are cross-referenced to the corresponding Figures. Because these regressions have severe statistical problems, it is necessary to focus not on the models but on the residuals from these models. Reading the residual plots is combined with a theoretical interpretation, setting the results of the analysis within proper social historical context.

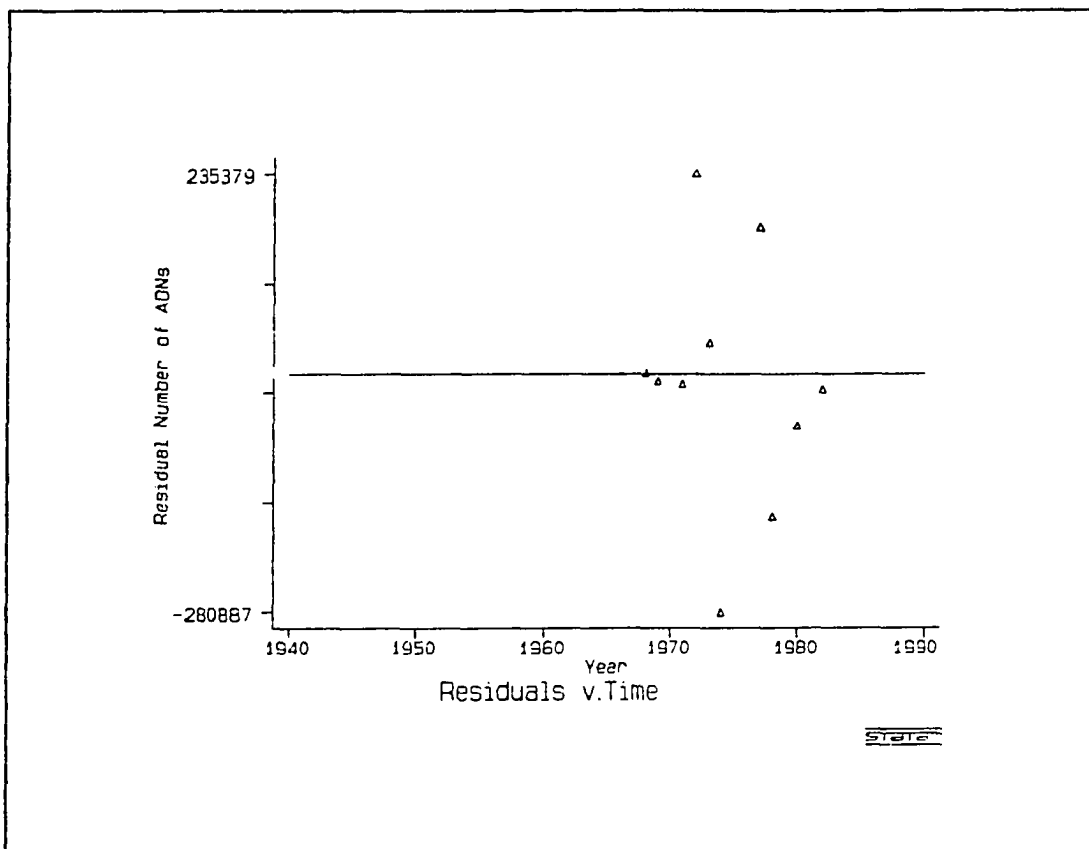
Before settling on the equations used to test the hypotheses, some independent variables had to be dropped because of insufficient data.



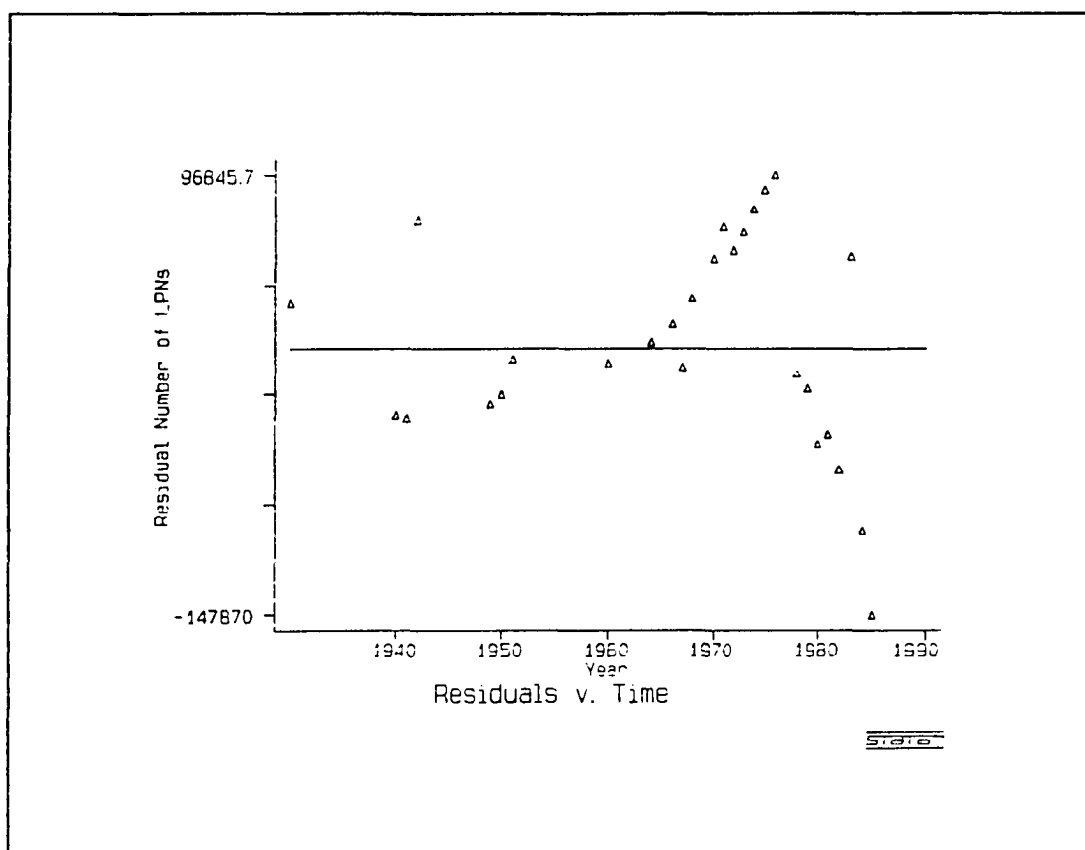
**Figure 32.** RN Requirement Residual Plot for the Regression of RN Labor Force on RN Salary, Female High School Graduates and Time.



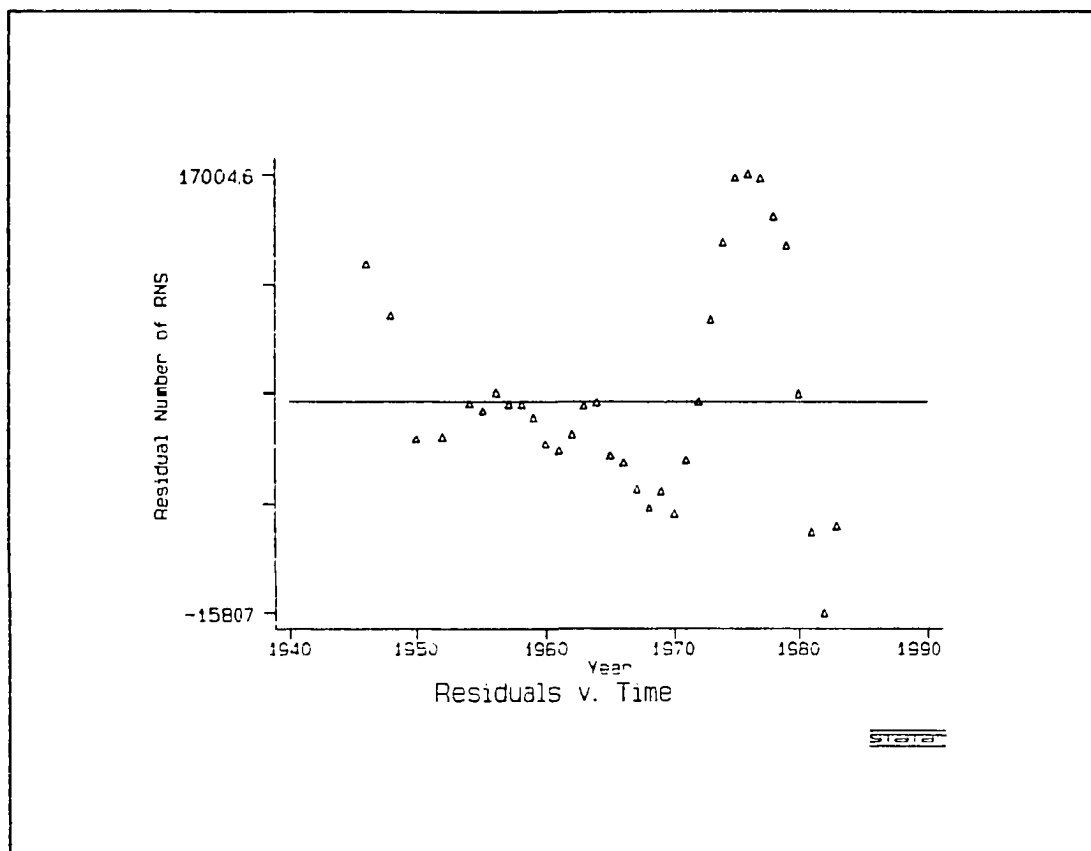
**Figure 33.** BSN Requirement Residual Plot for the Regression of BSN Labor Force on Female Professional Salary, Female Labor Force Participation 25-34 years and Time.



**Figure 34. ADN Requirement Residual Plot for the Regression of ADN Labor Force on HMOs and Time.**

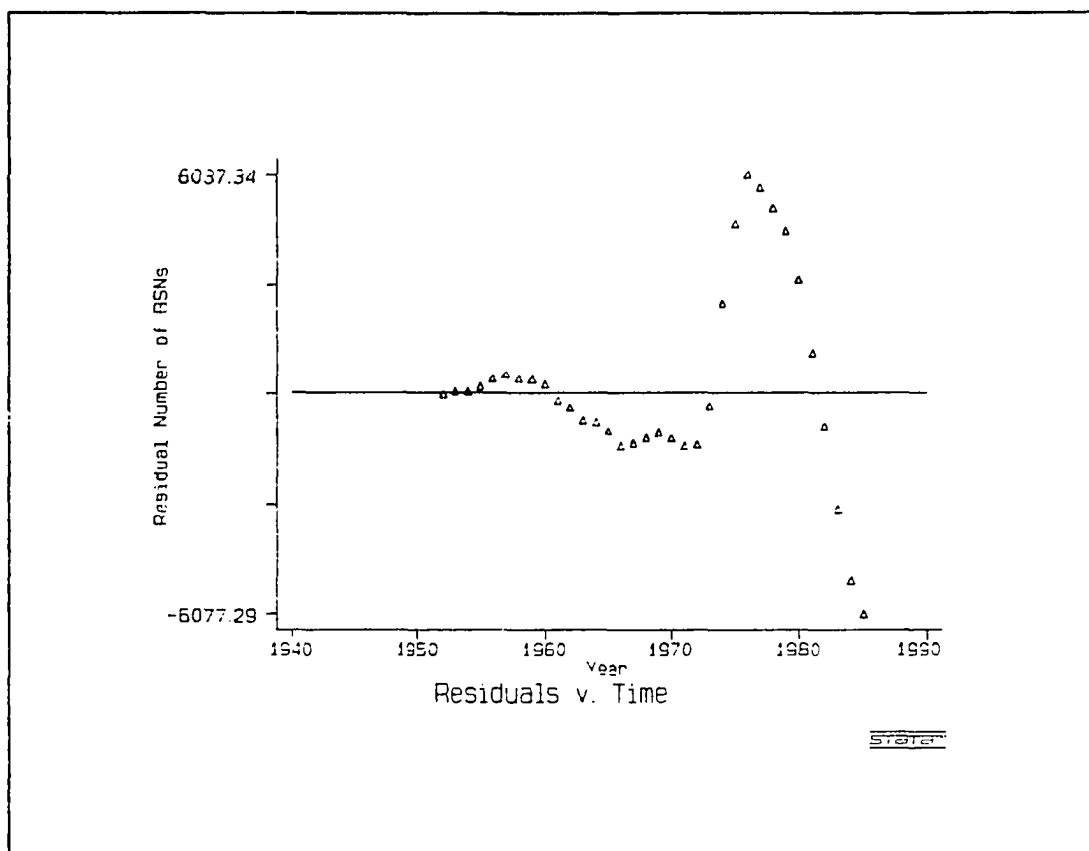


**Figure 35.** LPN Requirement Residual Plot for the Regression of LPN Labor Force on Resident Population >65, Hospital Occupancy Rate and Time.

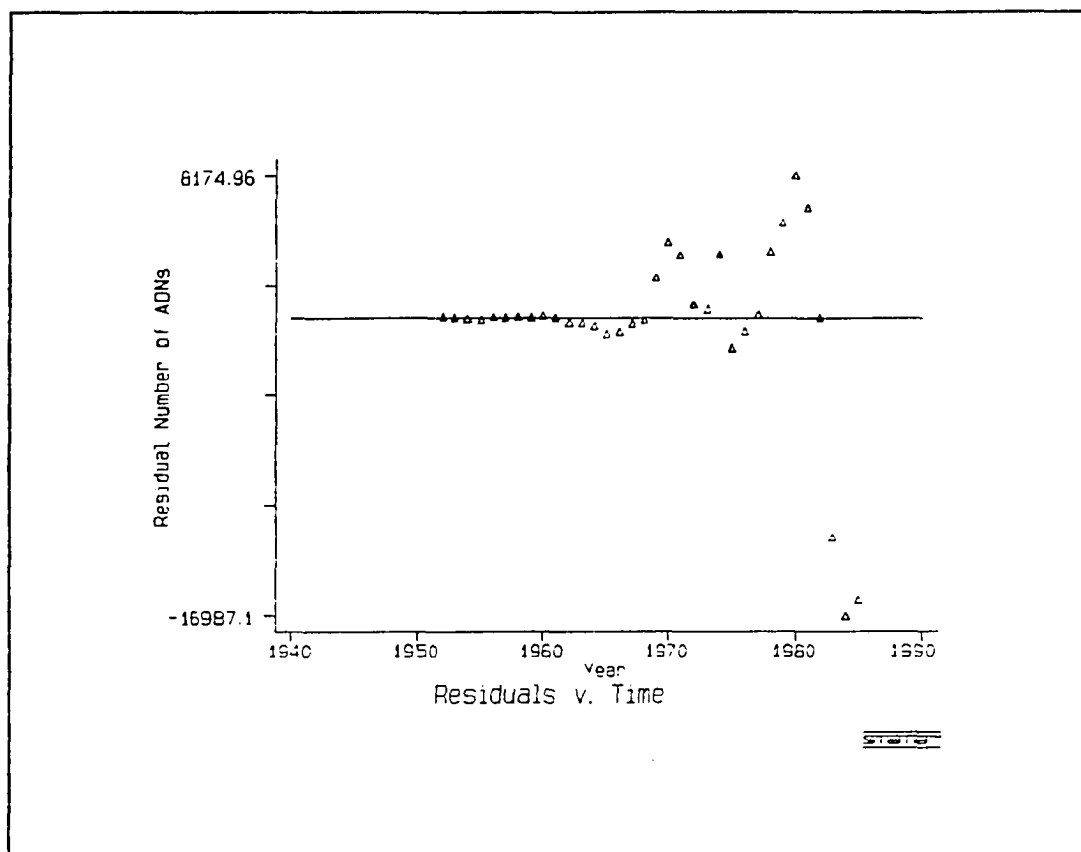


**Figure 36. RN Availability Residual Plot for the Regression of RN Graduates on Female High School Graduates, RN Salary and Time.**

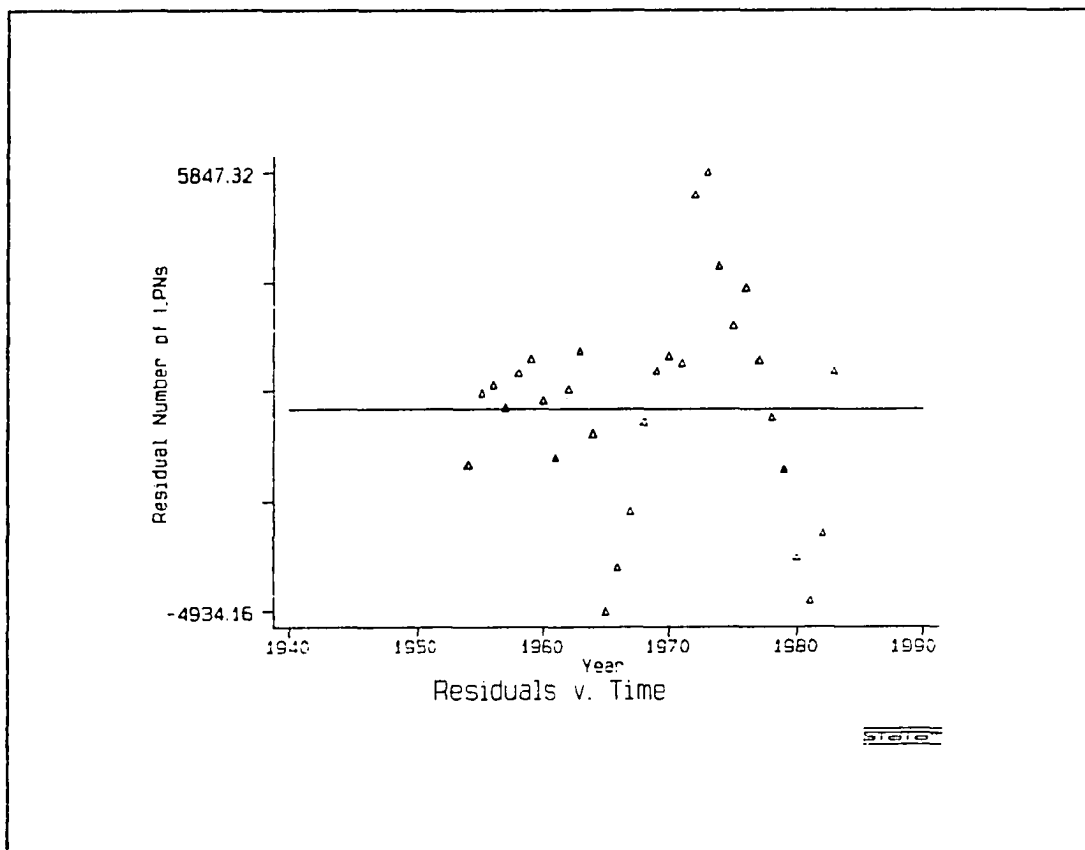




**Figure 37. BSN Availability Residual Plot for the Regression of BSN Program Graduates on Female Baccalaureate Graduates, RN Salary and Time.**



**Figure 38.** ADN Availability Residual Plot for the Regression of ADN Graduates on Female Labor Force 35-44 years, Female Labor Force 45-54 years and Time.



**Figure 39. LPN Availability Residual Plot for the Regression of LPN Graduates on Female High School Graduates, Female Labor Force and Time.**

Autocorrelation may largely reflect the influence of omitted variables. When important variables are omitted from the model, the coefficients on remaining variables are biased. This is another reason why we cannot give these coefficients a causal interpretation. Nonetheless, major economic and demographic variables were included wherever possible.

#### Analysis of Nurse Requirement and Availability Residual Plots

Figure 32. shows a residuals vs. timeplot for RNs active in the labor force was regressed on female high school graduates and RN salary. This equation does not reflect hypothesis number 8, because the independent (X) variables originally specified in the hypothesis (national health expenditures and hospital occupancy rate) did not have enough data points. The remaining independent variable, female civilian labor force, was found to be unrelated to the dependent variable. In an attempt to analyze nurse requirement active nurse participation was regressed on female high school graduates and RN salary. (See Regression Table 7. Appendix C.) Nurse requirement was higher than predicted for the years 1950, 1965 and 1980. It is likely that the need for nurses during the post World War II era and the time of the Korean conflict was greater than thought and unplanned. This condition is repeated for the Vietnam era as well, suggesting that as wars begin, we see more demand for nurses than would

be predicted from female high school graduations and RN salaries.

Nurse requirement was lower than predicted for the late 1950s, late 1960s and early 1970s, and the early 1980s. The late 1950s were a period of increased health care spending and consumer interest in preventive health care. It is likely that more nurses were thought to be needed in outpatient facilities at that time than could be utilized. This was the stated impression of nursing organizations and hospitals. The late 1960s and early 1970s saw the return of the Vietnam veteran, the culmination of the civil rights movement, and a country reeling and healing from a period of intense confrontation, civil disobedience, violent protest and rapid social change. The early part of this decade saw the emergence of a major communicable disease, AIDS, whose ultimate disastrous affect was unpredictable. This factor combined with rapid advancements in technology, leading to increased illness acuity and chronicity, further suggested a planned need for extensive nursing care which was not immediately realized in the marketplace.

"Almost perfect predictions" were made for the early 1960s and the 1970 mid-decade, using these independent variables as predictors. The early 1960s represent the high point of the Cold War and the Kennedy presidency. This period of the "Red menace" and liberal democratic political support of domestic health and welfare needs gave a clear message to

the nation, enabling an accurate assessment of health care need, particularly with regard to nurses. The mid 1970s saw a consolidation of gains made in the 1960s with regard to civil rights, women's issues, and the culmination of a national healing process. Again accurate prediction and economic valuation of nursing care was more likely to be possible in an era of calm, which encouraged reflection and an identification of basic societal needs.

Figures 33., 34. and 35. portray the prediction errors BSN, ADN and LPN need, respectively. BSN employment is predicted from female professional salary and female labor force participation 25-34 years. ADN employment is predicted from number of HMOs; LPN employment is predicted from resident population over age 65 and hospital occupancy rate. These regressions (See regression tables 8-12 Appendix C.) reflect hypotheses 9-11 (Refer to Chapter 3.). Reading the residual plots lends support for all three hypotheses, suggesting only that certain major trends, such as economic crises.

Female labor force participation and female professional salary appear to be accurate predictors of BSN employment during periods of crisis or rapid social change. Major overpredictions and underpredictions appear in this decade. This may be the result of an early anticipatory response of nursing to the need for nurses who can deliver highly skilled nursing care during the AIDS epidemic and a period in which hospitalized patients are acutely and seriously ill, requiring

high levels of theoretically and technologically sophisticated nursing care. The overestimate is probably further exacerbated by the failure to recognize economic signals which have triggered health care cost containment measures.

The impact of cost containment can be seen in the ADN predictions as well. In periods when the economy is weak or sluggish, cost constraints demand registered nurses, who can provide a high level of care, at a lesser cost. During such times the need for ADN nurses should increase beyond predicted levels, but this does not appear to be the case.

LPN requirement in Figure 35. appears to be either "on target" or under or overpredicted by an expected increase in the elderly population and a higher hospital census. It is likely that the pattern emerging shows an over-response to the recognition of the dramatic spread of the AIDS virus and the need of the elderly for both hospital and in-home care, as advanced technology prolongs life and increases population aging. The underprediction of LPNs in the late 1970s remains somewhat of a mystery. It is possible that nursing did not respond quickly enough to anticipated health system changes, ie. before their effects were felt in the health care system necessitating an increase in care-taking efforts.

Figure 36. shows errors in the prediction of overall RN availability. RN availability is predicted over the same 40 year period as RN requirement. Female high school graduates and RN salary are also the predictors of RN availability. This

regression (Refer to regression Table 11 Appendix C.) and the analysis of the residuals give support for hypothesis 12 (Refer to Chapter 3.). Interestingly, the "best" predictors of nurse requirement, actual nurses employed in nursing, and nurse availability, new nurses available to work in nursing, are the same. Again, however, major trends, such as political and economic conditions, ie. post war stability, are likely omitted variables.

At the close of World War II there was a failure to correctly estimate the number of nurses needed to assist in the care of returning soldiers. More were evidently needed than were apparently planned by nursing organizations, who actively sought to fuel the supply by continuing strenuous recruitment efforts. The federal government further supported these efforts by creating new programs for nurses within the military and public health service, as well as continuing wartime subsidies to nursing programs. During the post war period nurses also tended to remain in the labor force, while other female workers returned to the domestic sphere, but their numbers apparently were not significant enough to make a difference.

This mid-century mark issued in a period of reorganization for nursing, and the planned closing of many diploma nursing programs was expected to occur before the dramatic rise in ADN programs could "balance" the number of nurses in the labor force. A "panic" within nursing at the



loss of so many workers may have spurred overproduction in this era, but still not enough were predicted to adequately staff facilities. Nursing labor force participation throughout the sixties appears to be accurately predicted from the economic valuation of nursing and the pattern of female labor force participation, which was gaining great strength during this time.

The 1960s also showed a recognition of nursing care, as Federal subsidies were at their highest, since the World War II push to generate nursepower in the labor force. Nursing availability was overpredicted at the close of the sixties and in 1970. This period anticipated a necessary steady increase in BSN graduates entering the labor market along with ADN nurses. The late 1960s represent the "heyday" for baccalaureate nursing, a time which evidenced a high commitment to caring for the nation as a whole and particularly for college students. Female undergraduates flocked to nursing programs at an unprecedented rate during this period.

Nursing apparently sought to adjust supply to adequately meet demand during the 1970s, but an unpredicted oversupply of nurses entered the labor force. The response of nursing, by "cutting back" in 1980, and the concomitant societal devaluation of caring during the "me" generation or the era of the "norm of selfhood" saw a cycle of unpredicted overproduction at the beginning of the 1980s unquelled until

about 1982, when the pendulum swung in the other direction. This factor coupled again with the spread of AIDS and the technological prolongation of life, increasing in patient acuity and chronicity led nursing to again respond a cycle ahead in its planned response to societal need and social change.

Figures 37., 38. and 39. BSN, ADN and LPN are nurse availability predictions. These plots of residuals vs. time correspond to the regression equations shown in Tables 12-14 on page in Appendix C. The regression equations test hypotheses 13-15 (Refer to Chapter 3.).

BSN graduations are predicted from RN salary and female baccalaureate graduations; ADN graduations are predicted by female labor force participation for ages 35-44 and 45-54; LPN availability is predicted by regressing LPN graduations on overall female civilian labor force participation. The major assumption made with these three sets of predictions is that patterns of nursing labor force participation follow patterns of female labor force participation.

This assumption which sees higher education for women linked with employment possibilities and rising salaries works well for predicting BSN graduations through early 1970. From about 1972 to 1980 we can clearly see that the massive entrance of college women into the nursing profession created an oversupply of BSN nurses in the labor force. The retreat of female undergraduates from caring-oriented professions,

such as nursing, in the late 1970s, forced the 1980 decline in graduations and thus labor supply, which appear greater than could be predicted. It also appears quite clear that we have not planned properly for a labor force availability of BSNs in this time of rampant communicable disease, population aging and hospitalized patient acuity and severity. The supply of BSNs in the 1980 is much lower than predicted.

ADN availability appears to be well predicted at least up until about 1969, when the supply exceeded the prediction, possibly because of the phenomenal rise in ADN programs which continues unabated today. The pattern for ADN availability and the prediction of supply mirrors that for BSN graduates, most probably for the same reasons.

This does not, however, appear to be the case for LPN availability. It is likely that the "one cycle ahead" anticipatory response of nursing to social and demographic indicators has lead to overprediction of the supply in the mid 1960s and late 1970s into 1980, and the parallel underprediction for the mid seventies.

Analyses of residuals plots for the regression equations reported in Appendix C. enable us to read the "data story" of nurse supply from 1870-1988. They give us a picture of the trends which are associated with nurse requirement and availability. The hypotheses (8-15) "tested" by the crude prediction models are generally supported by estimates of the

data with the notable exception of original hypothesis number 8, which could not be tested.

In summary, residual plot analysis supported predictions of nurse recruitment and availability in that: (1) the number of BSN nurse employed in nursing increases, as female professional salaries increase and the population of 25-34 year old increases; (2) neither of these factors is associated with nurse employment activity on the other two educational levels, ADN employment appears to be related largely to the grow of HMOs, facilities which employ a large number of ADN nurses related; LPN on the other hand is related to population aging and hospital occupancy rate, reflecting the demand for LPNs in both hospital and nursing home settings; (3) successful recruitment of new RNs appears to be related to salary and the obvious availability of female high school graduates, not altogether surprising revelations; (4) general demographic factors, such as the availability of high school (for BSN and LPN nurses) and college educated women (BSN nurses), prerequisites for entrance into nursing, and social structural factors, such as female labor force participation by age group, appear to be the best predictors of nurse recruitment. at the ADN and LPN educational levels

## CHAPTER V ENDNOTES

1. See Hamilton, Regression and Graphics, (Pacific Grove, CA: Brooks/Cole) forthcoming, for details on how to read such plots.

## CHAPTER VI

### RESULTS, DISCUSSION AND CONCLUSION

Nurses, and the work that they do are important to American health care consumers. Periodic media "scares" which emphasize the potential loss of nursing care, hammer at consumer awareness. Fears of "still another nursing shortage" plague worried consumers, who have come to rely upon nurses to mediate medical services and health care.

This exploratory study tried to answer the two all-important questions about the state of nursing and nurse activity in the United States: "How many nurses are there?" and "How many nurses enough?" Answers to the first question were forthcoming in terms of nurse supply. Nurse requirement or the actual number of nurses working in nursing can be measured and looked at over time. Answers to this question can give us some basis for understanding the demand element regarding nurse labor force participation. Nurse availability, or the potential number of nurses that must be produced or recruited to meet our healthcare needs, was harder to get at.

This study took a sociological approach to empirical research on nurse supply. This approach is consistent both with previous analyses of nurse activity and with a feminist perspective on nursing as women's work. A feminist perspective

places women at the center of the study. This gives the researcher a basis upon which consider social structural, economic and demographic variables descriptive of women's work and a focus for the interpretation of results.

### Results and Discussion

Results from the three kinds of graphical analysis: timeplots, scatterplot matrices and residual plots, together with multiple regression, generally supported most hypotheses regarding nurse supply. The major findings include:

(1) Parallel trends in women's labor force participation and nurse labor force participation appear to exist;

(2) RN salaries, overall female salaries, women's labor force participation and women's educational attainment (specifically the pool of female high school graduates) are good predictors of nurse requirement and availability;

(3) A higher proportion of nurses at all educational levels of nursing are likely to be married;

(4) The requirement and availability of nurses at different educational levels are affected by the availability of different worksites and worksite characteristics;

(5) Black nurses are still underrepresented in the RN category;

(6) Nurse immigration does not substantially expand the pool of available workers;

(7) Part-time nurses have contributed to the overall increase in the nurse to consumer ratio;

(8) Female labor force participation affects different educational levels of nursing by age group.

Caution must be used in reviewing and disseminating these results. It was not possible to do more with these analyses than explore a crude model of nurse supply. Overwhelming statistical problems with multicollinearity, autocorrelation, curvilinearity and insufficient data points made it impossible to obtain reasonable parameter estimates for formal models. The best that could be done under these circumstances was to try to statistically remove major demographic, economic and social trends which might further bias the results of the data analysis. In the end it was clear that patterns of nurse supply were indeed affected by major social, political and economic forces, such as war and depression, and that these trends could not completely be removed. Nursing has changed more by design than by accident. In general the planned change has not occurred within nursing but rather has been imposed by other social institutions. The unplanned or accidental changes have occurred largely as a result of major social, political and economic forces.



## Conclusion

This exploratory study raised more questions than it answered. These questions about nurses and nursing should be considered empirical questions for further analysis and future study. The study of nursing as women's work seems not only plausible but relevant. Nursing is a female dominated profession. There has never been any question about that point. However, nursing is also women's work, work that has historically evolved out of women's traditional sphere, the home, and moved into the public sphere of paid labor. This trend seems unalterable. If the healthcare consumer continues to demand and need nursing care, it is important to understand the data and the story they tell us. to be able to "read the data story".

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## **APPENDICES**



## APPENDIX A

### Document I

#### Forecasting Models of Nursing Supply and Demand

In looking at future requirements for nurses either at the state or national level, most models fall into one of four groups:

(1) Econometric Models: These models take a traditional market approach to the understanding of labor market behaviour. Yett, Altman, Sloan, and Benham present some of the best and most flexible of the econometric models.<sup>1</sup> They and most other economists appear to agree that the market for nurses is dominated by hospitals, and that this dominance has increased over the years.

While most markets are not truly competitive, the labor market for nurses is a market affected by monopsony.<sup>2</sup> For a monopsonistic market to exist there must be the presence of only a few firms that employ the majority of workers in a particular occupational group. This occupational group should possess required and specialized skills for which there are few close alternatives. Additionally, the factor of geographic immobility must be present in order to establish the existence of monopsony power. Monopsony situations appear to be prevalent in nursing based, on the empirical evidence that

nurses do not move within the labor market in response to wage differentials. Hospitals also appear to wield monopsonistic power, because the outward slope of supply curves facing a hospital are non-elastic, indicating that variables hypothesized to have a positive impact on product demand also have a positive impact on wages. In a competitive labor market and in a monopsony, employment is raised, but only in a monopsony are wages raised as well.<sup>3</sup>

Two relevant outcomes of a monopsony are wage depression and lower industry employment. These are characteristic of the nurse labor market, in that for many years the hospital labor market has suffered the persistent disequilibrium of a monopsonistic market, i.e. "chronic shortages" is the watchword. Monopsony is seen as a classic example of "hiring-side market power".<sup>4</sup> This power is strengthened in hospital employment of nurses, due to the dominance of the hospital as an employer, the predominantly female composition of the nurse labor force, and the widespread absence of unionization. Hospitals are in a unique and highly favourable situation. They are able to keep wages at a relatively depressed level by reporting increased vacancies, thereby stimulating the output of nursing education programs, moving the supply curve upward and outward. As the excess demand continues, more nurses are made available for hire at existing wage levels. This is an ideal position for the hospital. More importantly, as Booton and Lane point out, "the persistence of market

imbalance provides hospitals with a rationale for not supporting a change in the educational requirements for licensure, since this would reduce the supply of available nurses over the short run."<sup>5</sup>

Additionally, as Aiken, Blendon and Rogers note, the versatility of registered nurses makes them available to perform a wide range of functions within the hospital, and, since the wage differential between registered nurses and other auxiliary and ancillary hospital personnel is so low, hospitals can easily substitute nurses for other employees.<sup>6</sup> This clearly works against nurses, because, if their wages are kept low relative to other hospital employees, they will be exploited and overused, strengthening the hiring power of the hospital and adding to the perception of a shortage.

(2) Historical Trend-Based Models: These models were developed in 1974 by the Resource Analysis Staff of the Bureau of Health Manpower in the Department of Health, Education and Welfare to assess the impacts of proposed program changes and legislative policy decisions on health manpower supply and demand.<sup>7</sup> The models developed were used to examine the interaction within and among consumer cohorts, health manpower groups, types of health care providers, and components of health education upon the introduction of new health systems variables to the health care delivery system, for example, national health insurance, increasing Health Maintenance Organization (HMO) enrollment, and the expanding role of the

registered nurse (RN). The models of the total health care system designed included three major components: civilian population projections; demand for services calculations, based on per capita utilization rates for six areas of health services including hospitals, nursing homes and physicians' offices; and aggregate RN requirements, based on utilization trends per service area.<sup>8</sup>

These models follow the prototype model set forth by the HRA staff and in general are system dynamics models which rely on model structure, a series of simulating complex non-linear social systems, as opposed to the parameter estimation techniques of econometric modelling. Examples of these models are the Pugh-Roberts Associates Model, the VRI Vector Models, and the CSF Model.<sup>9</sup> All three models, or model groups, were developed specifically as simulation or forecasting models, designed to "track the historical experience and to predict the future values of endogenous variables".<sup>10</sup> These models were not designed to test hypotheses or to explore the relationships of important variables, suggesting causal connections between and among the variables. The Pugh-Roberts Model is a national model which is concerned with distribution between employment settings and between types of educational settings. The VRI Models were specifically designed to evaluate the effects of anticipated health system changes on future requirements for nurses. The VRI Models produce requirements forecasts, but they do not produce supply

forecasts, as do the other two models. The CSF model, designed by Community Systems Foundation, Ltd., is used by the Division of Nursing and health care planning agencies as a planning tool for state and substate levels. It contains submodels that forecast health service utilization in acute and long-term care settings, as well as producing nurse supply projections.<sup>11</sup>

These historical trend-based models are useful and important for both practical and methodological reasons. The models are of primary importance in making accurate conditional forecasts. However, parameter estimation is a secondary consideration, and many of the models may be of great value in the design and specification of future models. The parameters that are generated by some of the models may serve as a basis for the a priori parameter estimations of newly developed or redesigned system dynamics models. Application of the analytic frameworks of the models, individually or as part of a larger linked system of system dynamics or different types of models, make it possible to examine trends in the provision of nursing services in major work settings at national, state, and substate levels. An example of this utility may be seen in the combination of the DHEW/DHHS historical trend-based models with the DHEW/DHHS WICHE model, a criteria-based model.

(3) Criteria-Based or Judgement-of-Need Models: The WICHE model, developed by the Western Interstate Commission on

Higher Education, was designed specifically to establish a framework for developing RN and LPN/LVN requirements as a planning guide for educational preparation and professional staffing.<sup>12</sup> The WICHE model differs from the econometric and historical trend-based models in that it does not define structural relationships between selected model variables. Rather it presents variables for inclusion and guides the construction and estimation of the variables. As a guide for planning, the inputs for the model come from a panel of experts. The criteria for choosing the panel members is based on the expertise in their fields of learning and their diversity of perspective. The panel members' role in the project is to define the key structural relationships of the model through a consensus approach, making projections according to the formulated model. The uniqueness of the WICHE model and other criteria-based models is that they emphasize the importance of the concept of need over the concept of demand in making their projections of nursing requirements.<sup>13</sup>

The WICHE model addresses the distribution requirements of state level nursing employment and divides these requirements into both work settings and provider levels, identifying four levels of RN and one level of LPN employment. This model has become more popular in recent years as patient age, chronicity, and acuity has increased, indicating an increased need for a greater number of highly trained nurses, possessing specific scientific knowledge and specialized

skills, to care for fewer, sicker patients. The model has also become more maligned, because its need-based design has resulted in higher nurse requirement projections than other models; implications drawn from these projections suggest that an inadequate supply of RNs and a low number of nurse caregivers impairs the safety and quality of patient care. Nursing leaders and experts, who are deeply concerned with the ethic of caring and safe standards of practice, tend to favor the need projections generated by this type of model. On the other hand hospital administrators, who have an eye toward cost containment, budget constraints, and profit margins, tend to make decisions based on payment arrangements. It is, therefore, to their advantage to use demand projections which make recommendations based on data supporting increased demand and declining supply. With increased demand and declining supply, nurse versatility becomes a more critical factor. Nurses can be and are "held captive" by market forces which control financial remuneration at low or compressed levels, restrict geographic mobility and exploit multiple role performance. "Given nurses' relatively low wages, this makes nurses, who are able to perform various tasks well and with little supervision, a bargain."<sup>14</sup>

The answer to this dilemma for American nursing should come in policy development and staff management which recognize the nature of nursing as a professional practice. Policy development and management affect nursing by directly

influencing the work environment. The quality and rewards of that environment must be structured to attract and retain qualified nursing personnel at all levels. Responsiveness to the employment needs of nursing should be supported by a scientific approach and the ethic of caring.<sup>15</sup> The Institute of Medicine (IOM) undertook a two year study of nursing and nursing education in early 1981. This study, mandated by Public Law 96-76, the Nurse Training Act Amendments of 1979, and prompted by controversy about the need for increased federal support to assure an adequate supply of nurses, analyzed both nurse supply and demand requirements as well as the nature and consequences of underservice or unmet staffing needs.<sup>16</sup> The Committee, overseeing the conduct of the research and the writing of the report, made a number of recommendations, summarized in Table 2. Among these recommendations was the finding that no specific federal support was needed to increase the overall supply of nurses, as IOM estimates indicated that the aggregate supply was in reasonable balance with the demand and would remain so throughout the decade. However, federal, state and private actions were recommended to alleviate geographical maldistributions and shortages. The IOM also emphasized the need for improved recruitment strategies for schools of nursing and the advancement of career ladder opportunities for nurses on all educational levels, in order to insure a continued supply of nurses to meet patient needs.<sup>17</sup> To support



their recommendations the IOM evaluated projected nurse requirements, generated by DHEW/DHHS and other models, proposing and demonstrating an alternative or "Illustrative Model".

(4) Illustrative Models: Models of the health care system which combine the analytic frameworks of other models and address more than a single category of nurse requirement can be properly placed in this category. These models may be primarily designed for either forecasting or hypothesis generation and/or testing. The IOM model was designed to determine the future need for nurses by "predicting demand as a means of understanding future needs"<sup>18</sup>. The model is a variant of the historical trend-based models and is structured by two important sets of variables, "change over time in the utilization of health services by the population" and "the rates at which RN services are used by various components of the health care system".<sup>19</sup> The results of the model projections suggest: a continued upward trend in health service utilization, HMO enrollment and use of ambulatory care services driving RN utilization upward as well.

In keeping with projected demographic trends, these health utilization trends further indicate that not only will demand for nurses increase, but so will the need. These trends in health care delivery systems impact upon and are in turn influenced by what is occurring in American nursing. This fact was clearly addressed by the December 1988 release of the

Health and Human Services Commission on Nursing Report, more commonly known as the "Bowen Report", as the Committee was chaired by then-Department of Health and Human Services Secretary Otis R. Bowen, M.D..<sup>20</sup> This report gives sixteen recommendations and eighteen strategies to alleviate nursing shortages where they appear in areas of nursing practice, particularly in hospitals where two thirds of all nurses are employed. The Commission's examination of the causes of nursing shortages points to the belief that the current shortages are primarily due to increased demand. Empirical evidence and expert witness testimony additionally suggested that, while the current number of RNs is at a record high, as RN graduations decline so will the future supply. It was further noted that, while the demand for hospital services has either remained constant or declined, hospital demands for RNs has increased. Severity of patient illness, the increase in the number of diagnosed AIDS cases, population aging, and advances in life-prolonging technology are possible reasons for the increased need for RNs, especially highly skilled practitioners.<sup>21</sup>

The Commission expressed concern that hospitals were not increasing their employment of LPNs, auxiliary and ancillary health personnel, thereby relying on RN versatility to meet patient care needs. The report suggests that the amount of stress and overwork experienced by RNs in their work environment may seriously jeopardize the quality of patient

care, forcing nurses to prioritize care, providing only the essentials, and leaving the "caring" out of care. Such a condition further exacerbates situations of shortage and may perpetuate further shortages due to nurse "burnout".

Overall the recommendations of the Commission address the use, development, and maintenance of nursing resources, focusing on issues of nurse compensation and nurse autonomy. The Commission stressed that improved salaries alone would not recruit or keep nurses in nursing. Beyond recommending increased decision-making for nurses on the job, the Commission also recommended expansion of nursing educational curricula to include those areas that are relevant to contemporary and future nursing practice. It appears that, as one nurse executive states, "only graduate nurses who are well educated and realistically prepared for challenge in the health care system will stay in nursing"<sup>22</sup>.

## Document II

### The Contribution of Sartre and Freud to Feminism

Sartre's dyadic construction of the creative subject self, or *pour-soi*, and the reified object self, *en-soi*, or "other", is seen as identifying male and female attributes, respectively.<sup>23</sup> Simone de Beauvoir adopted these theoretical constructs and attempted to explain the place of women by the application of existentialism to women's issues. de Beauvoir<sup>24</sup>

contributed to feminist theory by identifying the cultural and political status of women in patriarchal society. She saw the masculine as the norm and the feminine as the unnecessary or violation of the norm. Woman was defined and differentiated from man and seen only in reference to him. As women identified with the object or "other", they became alienated from any sense of a creative self. Ideologically, woman could only define herself as "other", unless she made the moral choice to reject her femininity and seek fulfillment as a transcending subject. For de Beauvoir and later Mary Daly<sup>25</sup>, who made important contributions to second wave feminist theory, this transcendence to the rational and critical mode of definition was necessary in order to move beyond patriarchal subjugation and the oppressive forms of patriarchal society.

Much of "second wave" or contemporary twentieth century feminism, as distinguished from "first wave" or the nineteenth century women's rights or the women's suffrage movement, has not only rebelled against and refused objectification and reification, but has also challenged and rejected the Freudian doctrine of male supremacy. Kate Millet's and Shulamith Firestone's critiques and negative analyses of Freud's views on women<sup>26</sup> brought to light the psychoanalytic brainwashing which had become an ideology of female subordination.<sup>27</sup> They identified an inherent biological determinism in Freud's

theories which condemned women to a destiny of pain and humiliation, based largely on a fluke of anatomy.

That Freudian theory is a rationalization of female subordination is countered by few feminists. However, a small group of feminists have taken Freud's views on feminine psychology and developed a contemporary form of Freudian feminist theory. This group, including Chodorow, Mitchell and Rubin<sup>28</sup>, interpret Freudian theory as suggesting an ideology of human society which sees gender socialization rooted in the psychodynamics of childhood sexual development. Females emerge from this process less differentiated and with a different emotional makeup from males. Women are, therefore, less apt to seize independent roles in society, being emotionally more suited for the private sphere. This process of creating gender identities reinforces woman's "feeling reality" and her sense of empathy and dependence rather than her "thinking reality" and sense of freedom and independence, thereby restricting women from entering the public sphere and consequently perpetuating the subjugation of women.

How feminists explain the status of women and view such concepts as oppression, socialization, and individual rights and responsibilities largely defines their theoretical stance. By differentiating theoretical approaches, it is possible to construct the development of feminism as a social movement as well as discern its theoretical antecedents. However, there is a danger inherent in this exercise, a danger of

compartmentalizing feminist approaches and of further fragmenting contemporary feminism. Delmar warns us that, although contemporary feminism does not represent a simple unity, it does have shared elements and dimensions, and by identifying the parts of feminism, we run the risk of advancing a "sort of sclerosis of the movement."<sup>29</sup> By taking the broad historical view that "an active desire to change women's position in society"<sup>30</sup> is central to all feminist approaches, the risk of further dividing contemporary feminism into component parts is limited, and the link between feminist theory and feminism as a social movement for change in the position of women may be strengthened.

### Document III

#### Additional Feminist Perspectives

Lesbian feminism and feminism for women of color were developed out of the radical feminism which espoused both Shulamith Firestone's recasting of the sexual division of labor with its stress on biology and Mary Daly's metaphysical voyage of "women's becoming". Consistent with radical feminism's call to action during the women's movement of second wave feminism, both lesbian feminism and feminism for women of color stress the awareness of multiple oppressions. Both women of color and lesbians share in the role of those victims who are doubly oppressed in society; both also share

dual allegiances to the women's movement and to the civil rights movement and the gay liberation movement, respectively. These are women who are oppressed first for being female and secondly on the basis of either race or sexual preference or both. These conditions make both groups uncomfortable with any feminist perspective or movement, including radical feminism, which does not recognize their unique cultural and identity differences.

In response to their particular needs as feminists these two groups have asserted their positions beyond race or sexual orientation and toward feminism, incorporating their specific identities. Lesbian feminists have sought to forge their two identities and focus on the creative potential of the lesbian aspect of all women, which when freed from patriarchal control, can express itself in the warm and loving relationships characteristic of female bonds. Black and Latina feminists, while expressing a desire to retain their racial and ethnic roots, have called for attempts to negotiate the differences between white feminists and feminists of color and ethnic minorities. True liberation for all women is seen not in emphasizing the differences between and among women, but recognizing and valuing these differences, while attempting to develop a sense of feminist community. White patriarchal society has dominated and subjugated all women, regardless of the differences in cultural experiences, and it is only through feminist unification on a pragmatic and a theoretical

level that true social change and liberation can be accomplished.<sup>31</sup>

Donovan<sup>32</sup> points out that feminists have looked at broader cultural issues since the nineteenth century. During that period cultural feminism can be identified as a strain of feminism which extends beyond the rationalist focus of Enlightenment liberal feminism of that period. Rather than focusing on political change, cultural feminists, such as Charlotte Perkins Gilman (Stetson), often identified as the leading theorist of first wave feminism, Margaret Fuller, who initiated the cultural feminist tradition with the publication of Woman in the Nineteenth Century (1845), and Crystal Eastman, a major proponent of pacifist-social reform, argued for change based on the matriarchal vision of the feminine virtues of altruism.<sup>33</sup>

Much of the work of the cultural feminists was in response to the masculine ideology evident in Social Darwinism, and cultural feminism proposed alternatives to the major social institutions of family life, marriage, and religion.<sup>34</sup> The development of "self-reliance" and its use in encouraging concern for loving relationships and building connectedness or imbeddedness in the community were also major tenets of cultural feminism.<sup>35</sup> In order to counter the "androcentric bias" of our culture, Gilman and other cultural feminists proposed a movement toward a more matriarchal value system which emphasizes "the principle of loving service".<sup>36</sup>



The practical extension of this theoretical construction would result in such dramatic changes as the professionalization and collectivization of much of women's domestic work, such as child care. Consequently, more of the personal or private, women's traditional sphere, would carry over into the public sphere with women's participation in public affairs and the opening of all professions to women. Because women were different by virtue of their socialization and their separate culture and heritage, they could bring a humanizing influence to the public sphere. As Crystal Eastman suggested, women's altruism was a needed contribution not just in the domestic sphere and in the suffrage movement, but especially in the public arena, where the struggles for reform in all areas relative to the sacredness of life, from childbearing to war, were being waged.<sup>37</sup>

Contemporary elements of cultural feminism are still evident and important in the development of feminist theory and the application of feminist theory to social world, although cultural feminism has not been further developed as a feminist perspective. The idea that women's political value system, developed out of traditional women's culture, can transcend the domestic sphere and become part of the public realm is an important factor in contemporary social reform movements. The unifying elements of women's culture can transform and humanize political consciousness and promote a social response which articulates a humane world view,

emphasizing pacifism and altruism in interactions and interrelationships.

This sense of unification is also notable in Black's<sup>38</sup> differentiation between equity feminism and social feminism. Black identifies all groups of feminists, whatever their ideological basis, who identify the extension of role equity as their goal, as "equity feminists".<sup>39</sup> Equity feminists, particularly liberal and socialist feminists, place great emphasis on theory construction, as a way to lend credibility to feminism by emulating male model building activities. She differentiates this group from those feminists, again setting ideology aside, who look beyond the male construction of rights and equality, to develop alternative social arrangements which do not embody patriarchal constructions of the social structure. Social feminists eschew ideology and seek to provide a theoretical base for feminism founded on a critique and reformulation of social policy. Analyses of "women questions" or women's issues, therefore, take either the form of accepting or rejecting the concept of difference between female and male realities. Equity feminists place women in the context of groups that have been oppressed or against whom discrimination has been practiced. Social feminists on the other hand perform contextual analyses which use the doctrine of difference to change society, not by eliminating differences, but by accepting differences and eliminating exclusions.<sup>40</sup>

## Document IV

### Definitions of Demand, Need and Wants

(1) Demand is a concept frequently used by economists and refers to the number of positions available to nurses at a market wage rate that they would be willing to accept. Demand estimates may predict or project both shortages and surpluses.

(2) Need refers to the quantity of nurses that health professionals or health care experts believe to be available in the system at a given point in time. Estimates of need are generally based on professional judgements of the number of nurses necessary to provide safe, therapeutically effective and efficient care for society. Projected estimates of need are generally higher than demand estimates, and more often show a shortage of nursing personnel. It is assumed that demand will increase to a level sufficient to provide employment at the levels of need established for quality nursing care.

(3) Wants refers to the quantity of nursing services that the consumer would like to have and can afford. Wants are rarely calculated formally, but provide a good qualitative estimate of the value that a society places on nursing care. The more educated in health affairs and the more affluent a

society is, the more likely wants are to fall in line with need and demand.<sup>41</sup>

## APPENDIX A ENDNOTES

1. Yett, 1975; Stuart H. Altman, United States, Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Bureau of Health Manpower Education, Division of Nursing, Present and Future Supply of Registered Nurses DHEW Publication No. (NIH) 73-134 (Washington, D. C.: U. S. GPO, 1976); Frank A. Sloan, United States, Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, Bureau of Health Manpower, Division of Nursing, Equalizing Access to Nursing Services: The Geographic Dimension Health Manpower References DHEW Publication No. (NIH) 78-51 (Washington, D. C.: U. S. GPO, 1978); Lee Benham, "The Labor Market for Registered Nurses: A Three Equation Model," The Review of Economics and Statistics 53.3 (2 August 1971), Massachusetts: Harvard University Press; the following two reports summarize some of the most recent findings of econometric studies: Linda H. Aiken, Robert J. Blendon, and David E. Rogers, "The Shortage of Hospital Nurses: A New Perspective," American Journal of Nursing (September 1981): 1612-1618; Carl J. Schramm, "Economic Perspectives on the Nursing Shortage," in Linda H. Aiken, ed., Nursing in the 1980s: Crises, Opportunities, Challenges (Philadelphia, PA: J. B. Lippincott, 1982) 41-73.

2. There do not appear to be any economists in the literature claiming a competitive hospital labor market for nurses. However, some, notably Booten and Lane (1985), suggest that the hospital demand may be characteristic of an oligopsonistic power, i.e. hospital employers not only face an upward-sloping supply curve, but also must gauge the reaction of other employers to the wages that are set. An oligopsonistic market has a discontinuity or "kink" in the labor supply curve rather than being the continuous supply curve of a monopsonistic market. Sloan (1978) introduces this idea in his review of the literature on monopsony. He also points out that there can never be a true test of monopsony until employer collusion can be directly measured.

3. Sloan, 57-86; Schramm, 41-73; Lavonne A. Booton and Julia I. Lane, "Hospital Market Structure and the Return to Nursing Education," The Journal of Human Resources XX.2 (1985): 184-196.

4. Sloan, 61-66.
5. Booton and Lane, 186.
6. Aiken, Blendon and Rogers, 1613-1614.
7. United States, Department of Health, Education and Welfare, Public Health Service, Health Resources Administration, Bureau of Health Manpower, Assessment of Health Manpower Modelling Efforts and the Development of Alternative Modelling Strategies Health Manpower References DHEW Publication No. (HRA) 77-17 (Washington, D. C.: U. S. GPO, 1976).
8. U. S., Assessment, 1-7, 109-126.
9. Deane, Robert T. and Kong-Kyun Ro, United States, Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, Bureau of Health Manpower, Division of Nursing Comparative Analysis of Four Manpower Nursing Requirements Models DHEW Publication No. (HRA) 79-9 (Washington, D. C.: U. S. GPO, 1979).
10. United States, Assessment, 116.
11. All of these models and a number of other HRA models, as well as alternative models, are either reviewed or described in detail in United States, Assessment (1976) and Deane and Ro (1979).
12. Deane and Ro, 15-26.
13. Deane and Ro, 1979; U. S. Assessment, 109-126.
14. Anderson, 11.
15. For a timely discussion of the ethic of caring in nursing see: Sara T. Fry, "The Ethic of Caring: Can It Survive in Nursing?" Nursing Outlook 36.1 (January/February 1988): 48; Lucie J. Kelly, "The Ethic of Caring: Has It Been Discarded?" Nursing Outlook Editorial 36.1 (January/February 1988): 17; Diane C. Viens, "A History of Nursing's Code of Ethics,"

Nursing Outlook 37.1 (January/February 1989): 45-49; Anne H. Bishop, and John R. Scudder, "Nursing Ethics in an Age of Controversy," Advanced Nursing Science 9.3 (1987): 34-43.

16. Institute of Medicine, Committee on Nursing and Nursing Education, Nursing and Nursing Education: Public Policies and Private Actions (Washington, D. C.: National Academy Press, 1982).

17. Institute of Medicine, 1-23.

18. IOM, 275.

19. IOM, 275.

20. United States, Department of Health and Human Services, Commission on Nursing, Health and Human Services Commission on Nursing Report (Washington, D. C.: U. S. GPO, 1988).

21. United States, Health, 1988; Jean A. Tribulski, "How You Can Use That Federal Report on Nursing," RN (February 1989): 61-67; Anne Allen, "Commission Questions Existence of RN Shortage," Journal of Post Anesthesia Nursing 4.1 (February 1988): 49-52; Nancy Perrin, "Bowen Commission Issues Report on Shortage," American Nurse (January 1989): 4, 20.

22. Pat Niessner Palmer, "It's Time to Put Some 'Teeth' Into Solutions to the Nursing Shortage," AORN Journal Editorial 49.3 (March 1989): 731-732.

23. See Jean-Paul Sartre, Being and Nothingness: An Essay in Phenomenological Ontology (New York: Citadel Press, 1966) for further discussion of the pour-soi and en-soi; see also Margery Collins and Christine Pierce, "Holes in Slime: Sexism in Sartre's Psychoanalysis" in Carol C. Gould and Marx W. Wartofsky, eds., Women and Philosophy: Toward a Theory of Liberation (New York: G. P. Putnam's Sons, 1976) 112-127.

24. Simone de Beauvoir, The Second Sex (New York: Alfred A. Knopf, Inc., 1957).

25. See Mary Daly, Beyond God the Father (Boston, MA: Beacon Press, 1973) and Mary Daly, Gyn/Ecology: The Metaethics of Radical Feminism (Boston, MA: Beacon Press, 1978).

26. See Freud's essays on women, femininity and female psychosexual and psychosocial development in various volumes of James Strachey, ed., The Standard Edition of the Complete Works of Sigmund Freud (London: Hogarth, 1964).

27. See Kate Millet, Sexual Politics (New York: Doubleday and Company, 1969) and Shulamith Firestone, The Dialectic of Sex (New York: William Morrow and Company, Inc., 1970) for a discussion of their views, critiques and criticism of Freudian psychoanalytic theory and sexism.

28. Chodorow, Reproduction; Juliet Mitchell, Woman's Estate (New York: Random House, Inc., 1971); Juliet Mitchell, Psychoanalysis and Feminism (New York: Random House, Inc., 1974); Gayle Rubin, "The Traffic in Women: Notes on the 'Political Economy of Sex'" in R. Reiter, ed. Toward an Anthropology of Women (New York: Monthly Review Press, 1975).

29. Rosalind Delmar, "What is Feminism?" in Juliet Mitchell and Ann Oakley, eds., What is Feminism? (New York: Pantheon Books, 1986) 8-33.

30. Delmar, 13.

31. See Donovan, 1988; Jaggar and Rothenberg, 1984 for a further basic discussion of lesbian feminism and feminism for women of color.

32. Donovan, 31-65.

33. Charlotte Perkins Gilman (Stetson), Women and Economics: A Study in the Economic Relation Between Men and Women as a Factor in Social Evolution (Boston: Small, Maynard & Company, 1898); Charlotte Perkins Gilman, The Home: Its Work and Influence (Urbana: University of Illinois Press, 1966) originally published in 1903; Charlotte Perkins Gilman, Herland (New York: Pantheon Books, 1979) originally published in 1915; Margaret Fuller, Woman in the Nineteenth Century (New York: Norton, 1971) originally published in 1845; Blanche



Wiesen Cook, ed., Crystal Eastman on Women and Revolution (New York: Oxford, 1978).

34. Donovan, 36-42, notes the contributions to the critique of Christianity by Gilman, Fuller, Elizabeth Cady Stanton and Matilda Joslyn Gage.

35. Fuller (1845) discusses the concept of self-reliance, which comes out of the romantic tradition. European romanticism and American transcendentalism, Donovan (32) points out, dictate the belief that individuals should fully develop their potential and take responsibility for their lives. Emerson's essay on "Self-Reliance" is seen as the classic expression of this romantic concept.

36. Charlotte Perkins Gilman, Man-Made World: Or Our Androcentric Culture (Reprint, 1971) originally published in 1911, 133, 251. In this work Perkins identifies American culture as being male dominated or androcentric and sets forth her matriarchal vision of altruism.

37. Eastman, influenced by Charlotte Perkins Gilman, saw social change as giving women opportunities in public life.

38. Naomi Black, Social Feminism (Ithaca: Cornell University Press, 1989).

39. Black, 9-29.

40. Black, 307-354.

41. Yett, 1975; Altman, 1976; United States, Effectiveness, 1973; IOM, 1982.

## APPENDIX B

Variable sources are as follows:

(1) Variables 2-26; 38-39; 42-43; 57-80; 94-95; 97-100 came from the ANA Facts About Nursing 1964 to 1986-87; the NLN Data Books 1978-1987; the federal Nurse Supply Surveys 1977, 1980, 1984 (RN), 1983 (LPN);

(2) Variables 27-37; 40-41; 44-56; 96, 101-104 came from U. S. Census reports; variables 32-37; 40-43; 52-56; 96; 101-104 also came from AMA and AHA data whenever possible;

(3) All female labor force variables prior to 1970 came from the U. S. Census Bureau Historical Statistics of the United States Colonial Times to the Present, after 1970 variables 80-93; 105 came from the Department of Labor.

Additional other anecdotal and historical sources were used to supplement the data as noted.

# APPENDIX C

Table 7. Regression Table

```
. regress logv7 v1 logv44 logv80
(obs=29)
```

Source	SS	df	MS	Number of obs =	29
Model	2.1661801	3	.722060034	F( 3, 25) =	573.42
Residual	.031480438	25	.001259218	Prob > F =	0.0000
Total	2.19766054	28	.078487876	R-square =	0.9857
				Adj R-square =	0.9840
				Root MSE =	.03549
Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv7					5.904421
v1	.0186781	.0108801	1.717	0.098	1968.655
logv44	-.2847384	.080328	-3.545	0.002	7.115768
logv80	.3328356	.1496377	2.224	0.035	6.354331
_cons	-30.95519	20.00328	-1.548	0.134	1

```
. predict logv7hat
(58 missing values generated)
```

```
. replace logv7hat=exp(logv7hat)
(92 changes made)
```

```
. generate le=v7-logv7hat
(63 missing values generated)
```

Table 8. Regression Table

```
. regress logv58 v1 logv82 logv90
(obs=25)
```

Source	SS	df	MS	Number of obs =	25
Model	16.9340965	3	5.64469884	F( 3, 21) =	1498.15
Residual	.079123537	21	.003767787	Prob > F	= 0.0000
				R-square	= 0.9953
				Adj R-square	= 0.9947
Total	17.0132201	24	.70888417	Root MSE	= .06138

Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv58					11.70244
v1	.0156238	.013695	1.141	0.267	1972.16
logv82	.6411771	.2812992	2.279	0.033	6.649155
logv90	1.454487	.2720022	5.347	0.000	3.920933
_cons	-29.07633	25.63243	-1.134	0.269	1

```
. predict lv58hat
(52 missing values generated)

. replace lv58hat=exp(lv58hat)
(92 changes made)

. generate le=v58-lv58hat
(67 missing values generated)
```

Table 9. Regression Table

```
. regress logv57 v1 logv36
(obs=16)
```

Source	SS	df	MS	Number of obs = 16		
Model	39.3264393	2	19.6632197	F( 2, 13)	=	100.88
Residual	2.53386887	13	.19491299	Prob > F	=	0.0000
Total	41.8603082	15	2.79068721	R-square	=	0.9395
				Adj R-square	=	0.9302
				Root MSE	=	.44149

Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv57					12.63187
v1	-.1356866	.0611993	-2.217	0.045	1976.625
logv36	2.698598	.4024567	6.705	0.000	4.923321
_cons	267.5474	119.0986	2.246	0.043	1

```
. predict lv57hat
(71 missing values generated)
```

```
. replace lv57hat=exp(lv57hat)
(92 changes made)
```

```
. generate le=v57-lv57hat
(76 missing values generated)
```

Table 10. Regression Table

```
. regress logv42 v1 logv35 logv37
(obs=27)
```

Source	SS	df	MS	Number of obs =	27
Model	5.43649617	3	1.81216539	F( 3, 23) =	45.57
Residual	.91472336	23	.039770581	Prob > F =	0.0000
				R-square =	0.8560
				Adj R-square =	0.8372
Total	6.35121953	26	.244277674	Root MSE =	.19943

Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv42					12.58147
v1	.0652907	.067787	0.963	0.345	1966.333
logv35	-1.453441	2.482436	-0.585	0.564	9.811809
logv37	-.4608621	1.896119	-0.243	0.810	4.375657
_cons	-99.52428	116.2302	-0.856	0.401	1

```
. predict lv42hat
(31 missing values generated)

. replace lv42hat=exp(lv42hat)
(92 changes made)

. generate le=v42-lv42hat
(65 missing values generated)
```

Table 11. Regression Table

```
. regress logv11 v1 logv44 logv80
(obs=34)
```

Source	SS	df	MS	Number of obs = 34	
Model	4.54654447	3	1.51551482	F( 3, 30) =	63.07
Residual	.720858468	30	.024028616	Prob > F =	0.0000
				R-square =	0.8631
				Adj R-square =	0.8495
Total	5.26740294	33	.159618271	Root MSE =	.15501

Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv11					10.68004
v1	-.062851	.0352175	-1.785	0.084	1966.206
logv44	.3379074	.2992987	1.129	0.268	7.028145
logv80	1.518982	.4916274	3.090	0.005	6.224878
_cons	122.4277	64.56294	1.896	0.068	1

```
. predict lv11hat
(58 missing values generated)
```

```
. replace lv11=exp(lv11hat)
(92 changes made)
```

```
. generate le=v11-lv11hat
(58 missing values generated)
```

Table 12. Regression Table

```
. regress logv71 v1 logv45 logv80
(obs=34)
```

Source	SS	df	MS	Number of obs = 34	
Model	24.1653318	3	8.0551106	F( 3, 30) =	288.92
Residual	.836392482	30	.027879749	Prob > F =	0.0000
Total	25.0017243	33	.757628009	R-square =	0.9665
				Adj R-square =	0.9632
				Root MSE =	.16697

Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv71					9.032233
v1	.0780553	.0378652	2.061	0.048	1968.5
logv45	.3340674	.240618	1.388	0.175	5.521306
logv80	-.1911533	.4823594	-0.396	0.695	6.356107
_cons	-145.2492	70.66265	-2.056	0.049	1

```
. predict lv71hat
(53 missing values generated)
```

```
. replace lv71hat=exp(lv71hat)
(92 changes made)
```

```
. generate le=v71-lv71hat
(58 missing values generated)
```



Table 13. Regresssion Table

```
. regress logv70 v1 logv91 logv92
(obs=34)
```

Source	SS	df	MS	Number of obs = 34	
Model	127.931568	3	42.6438559	F( 3, 30) =	859.84
Residual	1.48785761	30	.049595254	Prob > F =	0.0000
				R-square =	0.9885
				Adj R-square =	0.9874
Total	129.419425	33	3.92180077	Root MSE =	.2227

Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv70					8.483548
v1	.5175052	.0292144	17.714	0.000	1968.5
logv91	-11.25805	1.112736	-10.117	0.000	3.936445
logv92	-10.55797	1.273676	-8.289	0.000	3.956769
_cons	-924.1333	49.86504	-18.533	0.000	1

```
. predict lv70hat
(54 missing values generated)
```

```
. replace lv70hat=exp(lv70hat)
(92 changes made)
```

```
. generate le=v70-lv70hat
(58 missing values generated)
```

Table 14. Regression Table

```
. regress logv22 v1 logv44 logv86
(obs=30)
```

Source	SS	df	MS	Number of obs =	30
Model	9.66738545	3	3.22246182	F( 3, 26) =	425.79
Residual	.196773944	26	.007568229	Prob > F =	0.0000
Total	9.8641594	29	.340143427	R-square =	0.9801
				Adj R-square =	0.9777
				Root MSE =	.087

Variable	Coefficient	Std. Error	t	Prob >  t	Mean
logv22					10.19229
v1	.0336324	.0336688	0.999	0.327	1968.5
logv44	1.405043	.1849666	7.596	0.000	7.107085
logv86	-.4417581	.9114175	-0.485	0.632	10.32505
_cons	-61.4377	55.90098	-1.099	0.282	1

```
. predict lv22hat
(48 missing values generated)

. replace lv22hat=exp(lv22hat)
(92 changes made)

. generate le=v22-lv22hat
(62 missing values generated)
```